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DOCTORAL THESIS

Transitioning from Transit Oriented Development to Development Oriented Transit : a Case Study of the Gold Coast Light Rail Project

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***Transitioning from Transit Oriented Development
to Development Oriented Transit:
A Case Study of the Gold Coast Light Rail Project***

By David Neil Mephram

Submitted in total fulfilment of the requirements of the
degree of Doctor of Philosophy

**Bond University
Institute of Sustainable
Development and Architecture
School of Sustainable Development**

Abstract

In recent decades Australian cities have made significant investments in urban transit and this has been accompanied by a desire to achieve complementary integrated land use and 'transit oriented development' (TOD) outcomes; that is vibrant station places with higher densities, and mixed use development supported by an attractive pedestrian experience. However, this desire has not been matched with significant outcomes; in short, there has been a lot less delivered than might be expected. Urban transit stations continue to be situated in out of centre locations, more often supporting park and ride instead of enabling walkable access to goods, services and activities in the centre.

To explore this problem a single case study has been undertaken to understand how TOD objectives shape the transit planning process and outcomes. The method draws on documentary research and in-depth interviews which highlight the experience of key informants in the planning and design of the Gold Coast Rapid Transit (GCRT) project, an urban light rail, due to open in mid-2014, connecting a string of high density coastal centres.

The findings point to the limitations of a narrow, modernist, mobility focussed planning practice when seeking to realise integrated transit/land use outcomes. The first of these problems is the idea of 'transit oriented development' itself which, by definition, assumes that the land use objective is subordinated to transit.

The GCRT transit planning structure and process can be seen to have evolved in response to the need to integrate the transit into a dense urban environment. The transit planning process is seen by key informants as increasingly integrated and collaborative, engaging professionals from different levels of government and across the engineering, planning and design professions. When asked if the project is a transport project or a land use project, most key informants stated it was both, many noting that it was a transport project that has evolved to realise land use and TOD objectives.

The research highlights the importance of the transit planning process as an enabler for integrated planning outcomes and specifically the notion of 'development oriented transit', where new urban transit projects are oriented to potential development opportunities.

Declaration

This thesis is submitted to Bond University in fulfillment of the requirements of the degree of Doctor of Philosophy. This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where acknowledgement is made.



.....
David Neil Mephram

Student No 13025627

Monday 12th August 2013

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David Mepham

Abbreviations use in this thesis

BCC	Brisbane City Council
BRT	Bus Rapid Transit
CDIMP	Concept Design and Impact Management Plan
CTP	Gold Coast City Transport Plan
DOT	Development Oriented Transit
DTMR	Department of Transport and Main Roads (Queensland)
GCCC	Gold Coast City Council
GCRT	Gold Coast Rapid Transit
IRTP	Integrated Regional Transport Plan
LRT	Light Rail Transit
MASC	Mode and System Characteristics
PIA	Planning Institute of Australia
RASL	Route and Station Location
RFGM	Regional Framework for Growth Management
SEQ	South East Queensland
SEQRP	South East Queensland Regional Plan
SEQIPP	South East Queensland Infrastructure Plan and Program
TCP	Transit Corridor Permeability
TOD	Transit Oriented Development

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Part One – Research Background, Literature Review and Methodology

Chapter 1 - Introduction

1.1 Background Theory and Problem Statement

There have been two notable urban transit trends in the developed world in the past two to three decades. Firstly, a 'renaissance' in mass transit as an alternative to highway construction to solve growing urban transport problems (Muller 2004), and secondly, an interest in complementing these urban transit investments with Transit Oriented Development (TOD), emphasising higher density, mixed use development with improved accessibility in walkable, active and vibrant, urban environments (Newman & Kenworthy 1999, 2006).

Modern urban transit systems are designed and delivered by civil engineers, reflecting engineering values, significantly a product of major road and highway construction in the post war period. Other professionals such as land use planners and urban designers may become involved in the transport planning process but this is normally after the transport planning fundamentals have been determined, that is to determine the mode, route and station locations, with a focus on achieving the best set of transport numbers: the highest patronage and speed/travel time benefit at lowest cost/risk. Land use outcomes tend to come after the fundamentals have been decided reflecting a transport-first approach where urban planning and accessibility objectives are subordinated to the mobility objective.

This transit planning approach frequently results in stations being located out of centre; consider the Gold Coast heavy rail and Brisbane busway systems or Bus Rapid Transit and Light Rail Transit systems in Sydney, Melbourne and Adelaide. Such transit corridors achieve their transport efficiencies through significant segregation, often adjoining other impermeable corridors. This approach has negative impacts on the quality of the station place and for local pedestrian accessibility in the station precinct with stations often located in back of house locations and in car parks, disconnected from local activity.

The trend towards improving integrated land use outcomes has been supported in Australia with significant research and policy including the *National Charter on Integrated Land Use*

and Transport Planning, which states, in the first of its nine aims, that planning needs to be integrated, within and between, all levels of government (Australian Government 2003). It has however been noted that “bringing together the policy tools to achieve optimal planning outcomes in such a way to aid delivery is an ongoing challenge” (Curtis et al 2010, p. 22).

The trend towards improved integrated land use outcomes is supported by economic imperatives. The *Gold Coast Rapid Transit - Baseline Dataset Report* (Gold Coast City Council 2012c, p. 4) notes that firms will, over time, locate closer to areas with superior accessibility, reducing transaction costs through ease of contact with suppliers and customers, and better access to a skilled labour force. Increased access also increases total wealth through agglomeration “through allowing relative greater access to wealth generating activities” (Levinson 2010 cited in Gold Coast City Council 2012c, p. 12).

The broad value of improved transit-land use integration and TOD is reflected in the numerous urban transit projects proposed around the world and in the many planned extensions to existing systems as well as conversions of heavy rail to light rail with new stations potentially activating new locations. Light rail has been introduced or reintroduced into some 40 western industrialised cities during the 1980s and 1990s (Institute of Sustainable Development 2012). There are now some 400 systems in operation worldwide and systems are under construction in another 60 cities with plans for new light rail in over 200 cities. Europe alone has 170 systems in operation and nearly 100 more under construction or planning (International Association of Public Transport 2012).

Since 2000 Australian light rail systems have been created, upgraded or extended in Sydney, Melbourne and Adelaide. The Gold Coast light rail system is under construction and will be operational in late 2014. These new and expanding transit projects are increasingly tied to urban renewal, placemaking, local economic development and TOD opportunities.

There is also a growing interest in achieving stronger land use integration and TOD with new BRT systems reflecting the non-transit benefits from serving active station locations.

The idea of TOD draws on the traditional town planning ideas established by the likes of Ebenezer Howard, Raymond Unwin, Patrick Geddes, and others. It is articulated in contemporary planning philosophy such as New Urbanism and Smart Growth by

practitioners such as Duany, Plater-Zyberk (1994, 2000), Peter Calthorpe (1993, 2001), GB Arrington (2001, 2007, 2008), Hank Dittmar (2004), and academics such as Robert Cervero (1995, 1996, 2002, 2003, 2004, 2004, 2008) in the United States and Peter Newman (1996, 1999, 2005, 2006, 2007) in Australia.

The policy and practice around the delivery of TOD tends to be located within a modernist planning paradigm characterised by a culture of professional specialisation, task separation and siloed structures and practices. However there is also a move towards a rethinking of these practices. The Planning Institute of Australia: *National Position Statement on Integrated Land Use and Transport Planning* calls for:

The promotion and development of cooperative, comprehensive and on-going transport planning processes, fully integrated with the land use planning process, which are coordinated, innovative and have financial commitments from all levels of government and stakeholders. (PIA 2007)

This position statement goes on to call for “Federal and state legislation that defines and embraces transport planning requirements as part of a broader land use planning and development assessment” (PIA 2007).

TOD is increasingly a feature of planning policy at the state government level and this is particularly evident in Queensland. The 1995 South East Queensland (SEQ) *Regional Framework for Growth Management* (Queensland Government 1995) through to recent SEQ policies highlight TOD as an evolving planning objective supported by a TOD Planning Guide (see Appendix A) to assist in the development of the idea (Queensland Government 2010). Most recently the TOD objective is endorsed in the 2011 *Connecting SEQ 2031* policy with TOD projects proposed through the SEQ transit network (Queensland Government 2011d).

The approach to TOD in SEQ is based on a land use planning and urban design policy position that is focussed on development around an existing transit node. The challenge for achieving TOD in the SEQ transit system is that rail and busway stations tend to be located on the edge of the urban centre with the transit corridor acting as a barrier and often adjoining other barriers such as major roads, impacting on local accessibility and amenity (see Chapter 3.4 for detail of the Brisbane Busway route and station locations). Such outcomes reflect a transport planning philosophy in SEQ where government departments responsible for roads are detached from the notion of local accessibility, wield significant power and “have

repeatedly attempted to impose large-scale technological solutions for transport problems without regard for their wider impacts on urban life” (Butler 2008, p. 470).

The SEQ policies for TOD treat land use and urban design objectives as subordinate to the transport/transit design objectives, consistent with the idea of development oriented to transit. Consequently, achieving TOD often relies on the activation of transit stations located in inactive sites, physically isolated from the main activity centres, most often in large ‘park and ride’ car parks limiting urban development potential, TOD or otherwise.

The SEQ TOD vision tends to be articulated through individual decisions by private developers rather than through a holistic view of the transit station precinct (James 2009, p.187). The term is used in this thesis to imply more than ‘a development’, instead, it is the sum of many public and private urban design and development decisions, underpinned by a commitment to people, pedestrians and place. In this respect the approach reflects that advocated by Peter Calthorpe in the *Next American Metropolis* (1993).

Calthorpe’s approach transcends transit as mobility to consider wider transit impacts on local accessibility. Calthorpe contrasts his planning philosophy with modernist planning:

The foundation of our current aesthetic of place is Modernism. Across political ideology, modernism defines the fundamental nature of our time: segregation, specialization, centralization, and an undying dedication to technology... the segregation of activities and peoples, the specialization and isolation of professions and the systems they create, the centralization of ever larger institutions, and the monopoly of certain technologies, most notably the car. (Calthorpe 1993, p. 11)

Robert Cervero (1998) highlights a weakness in a narrow transport planning practice by noting the need for a wider view of travel as a means to an end, the end being people and places, not travelling which people actually prefer to avoid:

Accordingly, transportation planning should be subservient to the broader goals of comprehensive land-use planning, i.e. the planning for people and places. Thus, we should not be creating urban environments to promote transit; this puts the cart before the horse. Rather, transit should be serving land use visions and realities. (Cervero 1998, p. 12)

A consequence of the current ‘transit first’ approach is that the good intentions for TOD have not been matched by good outcomes. Burke et al. (2011), writing in relation to Australian cities, find that whilst TOD is a key focus it has been difficult to realise (Burke et al

2011, p. 1). Whilst Hale and Charles (2007 p. 10) note that progress on identified TOD sites in SEQ has been slow.

This research contends that enabling TOD requires a view beyond the focus on land use development to properly consider the importance of the transit planning process. The enabling factors for TOD need to be integrated within the 'DNA' of the transit planning process, to shape the transit planning and design outcomes. The idea of inverting the transit – development relationship is useful here so that instead of focusing on TOD per se, transit planners think of the objective as 'Development Oriented Transit' (DOT) so that the planning focus looks beyond simple mobility to orient transit to the integrated land use development and accessibility objectives. The DOT approach can be seen as a planning process leading to an outcome different from TOD and acknowledges how transport and land use objectives can be in tension. These conflicts are especially evident in the two key TOD enablers considered in this thesis: the Mode and System Characteristics (MASC) and the Route and Station Locations (RASL).

MASC is a term that looks beyond the mode itself to also consider the system characteristics of the mode, that is higher speeds or frequencies result in system characteristics such as higher corridor segregation, with low or no permeability. RASL highlights the relationship between the route and the station location: in some cases the route is defined by the desired station location, in other cases the station is defined by the route. MASC and RASL are related concepts; they inform each other and are central to a discussion on the way in which the transit planning process is an enabler for integrated land use and TOD outcomes, note the transport – land use feedback cycle in Image 2.1.

This research explores how TOD objectives influence the urban transit planning process and outcomes (see Section 1.3 for details of the research question and sub-questions). Asking the question of how the land use and transit relationship is understood by those in the transit planning process raises questions about transport and land use planning ideas, cultural practices and entrenched values, the nature of the modernist transport/transit planning paradigm, the dominance of civil engineering over transport planning, and the tendency to focus narrowly on pure transport solutions to the exclusion of wider considerations.

The research problem develops from the view that, in spite of significant opportunities and good intentions, the SEQ TOD policy has generally failed. Understanding how land use and TOD objectives are dealt with in the transit planning process highlights a pathway towards a transit planning practice that enables integrated planning and TOD outcomes.

1.2 Key Definitions

There are a number of recurring terms that need to be defined early in this research for the purposes of clarity.

The term *Transit Oriented Development* (TOD) and *TOD objectives* is used to describe a planning outcome where higher density, mixed use development is located so that it is oriented to the transit station and that the station precinct is permeable and accessible for pedestrians. The idea of TOD is expanded on through this chapter and in the literature review. Section 2.3 outlines the key TOD ideas from academics and practitioners who have contributed to the thinking on TOD. It should be noted that TOD is also used throughout this paper in a short hand way to capture the idea of an integrated transit planning solution.

The term *Development Oriented Transit* (DOT) is used in this research to highlight a transit planning process and outcome that acknowledges and balances, and may even prioritise, the land development – city building objective over the transit/transport planning objective.

The term *transit* is used throughout this paper consistent with the language of TOD or DOT. In Australia transit is generally considered to be an American term for *public transport* but it is well understood and increasingly used in Australia and its use is appropriate to the subject matter here. The term *transport* is often used with *transit* and the intent here is to tie transit planning back to its transport planning roots, notably the idea that modern transit planning practice is effectively an extension of the practices developed through major road and highway construction.

The term *at-grade urban transit* is intended to confirm that the subject of this research is on-street urban transit as opposed to underground or elevated transit or metro systems or those outside of the built up urban area. There are significant cost differences and impacts between at grade urban transit and that built on structure or in tunnels. The relevant issue

here is the difference in the planning and urban design practice and outcomes and their highly visible impacts in the urban environment.

The term *mode and system characteristic/s* (MASC) is used to emphasise a meaning beyond that of the mode itself to consider the wider system characteristics related to the mode. For example bus rapid transit and light rail have different characteristics and different impacts in the urban environment and can be related to different transport and land use outcomes.

The term is capitalised in the research questions to emphasise the importance of the concept.

The term *route and station location/s* (RASL) is used to reinforce their inter-relationship and significant impact on land use outcomes. The RASL, be it on the urban edge or the centre, is a critical enabling factor in the transit/land use and TOD outcome. RASL and MASC are related concepts in this research as key transit planning enablers for TOD outcomes.

The term *modernism* is used in this research in contrast to traditional – holistic forms of planning. Modernist ideas include the separation of day-to-day activities and the reliance on the car to connect these activities. In this respect modernism tends to support low density suburbia, the privatisation of space and car mobility rather than a compact city form that emphasises the public realm and accessibility. In terms of transport planning practice modernism emphasises siloed and specialised processes and structures and a narrow emphasis on engineered transport solutions over a holistic view of planning and design.

The terms *access and accessibility* emphasise the ease of local pedestrian movement. These terms are contrasted with the notion of *mobility*, emphasising how transport planning is often done at the expense of local pedestrian movement which is critical to TOD. The terms access and mobility might be seen as conflicting rather than complementary concepts.

The term *permeability* is used in this research to refer to the ability to move through the at-grade urban transit corridor. It highlights the way in which otherwise efficient transport and transit corridors are segregated and create barriers to local pedestrian access.

There may be other, uncommon, terms used throughout this research, dealing with elements of transport or land use planning or local, colloquial terms, and the author has attempted to ensure that they are explained in the course of the research.

1.3 Focal Theory¹ and Research Questions

The exploration of how TOD objectives influence the transit planning process is developed through a single case study of the Gold Coast Rapid Transit (GCRT), an at grade, urban light rail project planned to be operating in late-2014. Stage one of the project runs for 13 kilometres, substantially through the dense Gold Coast beachside centres, characterised by high rise residential and hotel development and significant pedestrian activity. Note image 1.1 below showing the route through Surfers Paradise. The detail of the case study is introduced in Section 1.5.

The thesis is shaped by four concepts which have been developed from the literature and these ideas create the framework for the case study research. The first idea is to consider the relationship between transport/transit the urban environment and TOD

The second idea is to understand the transit planning process. This is rarely acknowledged as a factor in the enabling of TOD, yet a closer look at this issue highlights the process as a significant enabler for land use outcomes and TOD.

The third idea is to explore the issue of the Mode and System Characteristics (MASC) as an enabling factor for TOD, shaping the fourth idea which is to consider the issue of the Route and Station Locations (RASL) as enablers for land use outcomes and TOD.

This framework structures the research to provide a relationship between the different concepts and the sources of evidence. The detail of the research question and sub questions is dealt with in the following section.

¹ The term ‘focal theory’ is used by Phillips and Pugh in their book ‘How to Get a PhD: A Handbook for Students and Their Supervisors’, p58, and refers to the specific detail of the research.



Photos by David Mepham

Image 1.1 GCRT Route through Surfers Paradise (looking south on left and north on right).

1.3.1 Research Question and Sub-Questions

The primary research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* This question is addressed through four sub-questions focused on the Gold Coast light rail case study:

1. *How does transit shape the urban environment and transit oriented development objectives in the corridor?*
2. *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?*
3. *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?*
4. *How is the Route and Station Location shaped by Transit Oriented Development objectives?*

The main research question can be seen to invert the usual approach to the transit/land use relationship by focussing on land use/TOD not as the passive end product of the transit planning process but as an active driver for the transit planning process and outcomes.

1.3.2 Focal Theory and Research Question Summary

Transit Oriented Development is a term implying a relationship between development and transit. This meaning is supported by the significant literature and policy documentation which confirms the development objective as subordinate to the transit planning objective.

Reviewing the transit and TOD literature through this 'relationship' prism, it can be seen that land use outcomes are enabled through the transit planning process and outcomes but it is not clear how these 'enabling' decisions are impacted by, or on, the land use/TOD objective.

The research questions explore an alternative view of the transport/transit – land use relationship in a way that is consistent with the new thinking about integrated planning and TOD outcomes. This approach requires a method that looks beyond modernist transport planning theory and knowledge. The detail of the method is discussed in Section 1.4 below.

1.4 Overview of the Method

Transport planning research tends towards an engineering perspective with a focus on 'hard' quantitative data. As a consequence there tends to be little research into the questions of 'how' and 'why' things do or do not happen in the transport planning process.

The approach used in this research is consistent with the trend towards a "broadening and deepening from a focus on the rules of traffic engineering to the economic, social and policy implications of social research" (Godwin 2012, p. 18). This research builds on this trend, both "broadening and deepening" knowledge through an explorative, qualitative research approach to advance a unique insight into the transit and land use planning relationship.

This research is based on a single case study on the Gold Coast Rapid Transit (GCRT) project covering the period from its conception in Gold Coast City Council in the late 1990s through to the feasibility phase and concept design completion in March 2009. The GCRT project is appropriate and attractive for this research for the following reasons:

- two modes, bus rapid transit and light rail transit, were the subject of intense debate and detailed investigation to determine the appropriate mode for the corridor;
- the route and station locations were, in some places, the subject of intense debate and required careful consideration of how to achieve integration into a dense urban environment;
- there is good evidence of the project having considered the integrated land use and TOD objectives from its early feasibility planning phase;
- the project planning and design has involved three levels of government with a range of stakeholders, organisations, professions and objectives;
- the project location and timing enabled good access to relevant people and detailed data; and
- the substantial evidence available from the project provides an insight into how TOD objectives shaped the transit planning process.

The high level of access into the project space is enhanced by the author's involvement with the project from the early planning and design process, from 2005, through to the planning and design finalisation in 2011. The author's involvement in the project enabled access to relevant informants involved in the planning process. The interviews were mainly conducted after the author or the interviewee had departed the project team. Nonetheless, it follows that there are also risks in the quality of data and its interpretation. The research process has been designed to maximise transparency and to ensure data reliability and rigour. This issue is explored in more detail in Chapter Four – The Research Method.

The research is organised according to key themes, theories and ideas drawn from the literature dealing with the way in which TOD outcomes are enabled in the transit planning process. The data are drawn from three key sources of evidence; they are as follows.

Firstly, the research reviews the literature relating to transit and land use and then specifically for TOD, especially in relation to the way it is enabled in the transit planning process. Secondly, the SEQ regional planning policy framework from 1995 to 2009 is analysed to understand the background policy environment and intent with regard to land use, TOD and integrated transport policy. Key planning and design documentation is then analysed, notably the 2004 Gold Coast Light Rail - Feasibility Study and the 2009 GCRT Concept Design and Impact Management Plan (CDIMP) documents, to confirm the formal planning and design intent for the project. Thirdly, a series of in-depth interviews have been undertaken with relevant informants involved in shaping the GCRT project from its inception. They explore the values, beliefs, behaviours and actions of those who have

shaped the planning and design process and how they evolve in the project space. Non-planning professionals involved in shaping the project, such as local councillors are also interviewed to confirm their understanding of the wider issues. Each interviewee agreed in writing to being identified in accordance with the requirements set by the Bond University Research Ethics Committee, see Appendix D.

The interview data are analysed according to a content analysis technique which enables key meanings from interviews to be distilled. These meanings are consolidated and abstracted for analysis and cross referenced with the literature review findings and the policy and documentation data to enable final conclusions and original contribution to be established.

The approach is inductive however the evidence framework is developed through a 'directed content analysis' of the data to identify the key ideas and meanings. This approach is described by Hsieh and Shannon (2005) as an option where an existing theory or prior research about a phenomenon is incomplete. They note that the goal of a directed approach to content analysis is to "validate or extend conceptually a theoretical framework or theory" (Hsieh & Shannon 2005, p. 1281). Existing theory or research assists in focussing the question, providing predictions about the variables of interest and relationships between codes. In this research a theoretical framework for the transit/land use relationship is developed through the literature review and honed through an inductive process to explain the structural and process issues within this framework.

There are challenges with the reliability of data from single case studies. In this research the internal validity is realised through the in-depth nature of the narrative interview where a range of informants with different roles in the project are able to provide detailed responses. Elliott (2005, p. 23) argues that internal validity may be improved by the use of narrative "because participants are empowered to provide more concrete and specific details about the topics discussed and to use their own vocabulary and conceptual framework to describe life experiences". This research reflects on the values and beliefs that develop within the project. Through the interview process participants are able to explore their experiences and understanding about the project in relation to the land use and transit planning objectives.

The external validity of this single case study realised by the number of interviews and the triangulation with other data sources (Yin 2009). The author has been careful to ensure a cross section of views to reflect levels of government and different professions. The single case study is exploratory in nature dealing with questions of 'how' so there is a need for care with generalisations about the findings but the reader is invited to make a 'common sense' judgment about the way in which the research and its findings can be applied to other urban transit projects. Elliott notes the trade-off between depth and breadth in qualitative research (2005, p. 26). This research is narrow in its focus but contains considerable depth. At the time of writing there has been no similar research undertaken to enable comparisons; in this sense the research here is both original and unique. In the future it may be possible to compare the findings here with other research and to build the validity of this research.

The relevance of the research may be constrained by the highly urbanised nature of the case study corridor when Australian transit runs substantially in low density suburban areas, often to the edge of the urban environment. Alternatively, at grade light rail is increasingly being extended into dense urban environments such as Haymarket (Sydney), St Kilda (Melbourne) or Glenelg (Adelaide), (these examples are discussed further in Section 3.5).

This research presents a number of challenges and opportunities. The qualitative research method is unconventional for a transport planning investigation. The research method does however develop an area of transport planning that is not well understood and specifically extends the knowledge on how TOD might be enabled through the transit planning process.

At a time when new urban transit projects are being advocated, planned, designed or constructed there is a need to develop a better understanding of how to address integrated land use and TOD objectives. This research method seeks to make such a contribution.

1.5 The Case Study - Gold Coast Light Rail

Gold Coast City is located in the south east corner of the State of Queensland in Australia. It is a city that developed substantially in the post war period and, with a population of 541,000, is the sixth largest in Australia (Gold Coast City Council 2012). The original compact

coastal settlement has sprawled in a low density form to the west with high car dependency and relatively low public transport use. (Queensland Government. 2011d, pp. 91 & 120)

The discussion about a light rail for the Gold Coast goes back to the mid-1990s, but it was not until the *Gold Coast City Transport Plan* (1998) that the light rail was formally proposed as a solution to increasing urban congestion. In 2004 a study was undertaken to confirm the feasibility of the project and the decision to proceed with a “dedicated public transport spine linking the centres of Helensvale/Parkwood and Broadbeach and ultimately Coolangatta” was announced in the 2005 *SEQ Regional Plan* (Queensland Government 2005, p. 118). The *Concept Design and Impact Management Plan* (CDIMP) process commenced from late 2006 (Queensland Government 2009d).

The detailed plan for stage one of the GCRT, as detailed in the CDIMP, was endorsed by the Queensland Government and the Gold Coast City Council in late 2008 with Council committing \$120 million towards the project. In May 2009 the federal government committed \$365 million towards stage one as part of the Infrastructure Australia initiative and later that year the Queensland Government committed \$464 million bringing the project funding to almost one billion dollars (Queensland Government 2012, p. 7).

Having confirmed funding, the project commenced procurement for the construction of stage one. Following an ‘Expression of Interest’ and ‘Request for Information’ process the operator franchise ‘GoldLinQ’ was selected in May 2011. GoldLinQ is a consortium made up of several companies: KDR Gold Coast (a joint venture between Keolis and Downer EDI Ltd), Bombardier Transportation Australia, McConnell Dowell Constructors, and Plenary Group. The system will be constructed through 2012/13 and be operational by late-2014.

The ongoing government and community support for the project reflects the significance of the transport challenge for the Gold Coast. The high density coastal edge has not had the shaping influence of rail or tram, however, the string of compact coastal settlements provides an urban form very well suited to a walk up mass transit solution. This particular characteristic underpinned the case for the mode and route.

1.5.1 Mode and System Characteristics (MASC)

The idea of a light rail for the Gold Coast was championed by Gold Coast City Council in a period of major busway transit investment for the Queensland state capital, Brisbane. When the state government announced the planning of the GCRT project the planning was required to investigate both BRT and LRT options, which had previously been confirmed as viable mode options in the 2004 Gold Coast Light Rail Feasibility Study. This study also considered and rejected monorail and Personal Rapid Transit as unsuitable for the Gold Coast (Queensland Government 2004, p. A8.4). Details of the feasibility study and concept designs are discussed in Section 5.3.

There is detailed interview commentary on the debate about MASC within the project in Section 6.4 and this narrative reflects Council's support for light rail while the State is supportive of BRT. Supporters of light rail point to the benefits of permanency, a positive urban image and better integration into the urban environment with opportunities for new development and TOD. Alternatively bus/BRT systems were seen as a cheaper, flexible transport solution.

The intensive MASC debate and investigation provided the opportunity to draw out the related transit/land use issues. The extent of the commentary in the interviews reflects the evolving importance of the integrated planning objective. In that debate it is also evident that the MASC have consequences for the RASL.

1.5.2 Route and Station Locations (RASL)

The 2004 Feasibility Study provided a range of route options to meet objectives such as: providing a coastal experience, an express service, or urban regeneration outcomes (Queensland Government 2004, p. B4.1). The focus on RASL issues is dealt with in the interviews in Section 6.5 and in this was a view that the RASL was 'obvious' and while this may have some substance in Surfers Paradise, in other areas, particularly in Southport, the RASL was highly contentious and highlighted conflicting objectives within the state and local governments, the local communities and even within the project. Note Image 1.2 below showing the route and key precincts on the route.

While the RASL is not related to MASC in the CDIMP or government policy, the interviews highlight the way in which the RASL is enabled by the MASC decision. The GCRT was consistently argued by Council to be a city building project based on light rail to enable a RASL serving key centres so that the opportunities for renewal and TOD are maximised.

In Section 6.6 when asked to comment on whether GCRT is a transport or a land use project the interviewees across the range of organisations and professions responded strongly in favour of the project being substantially about realising land use outcomes as well as transport. It is evident that this view is one that 'evolved' through the course of the project.

Overall the GCRT provides a case study where a high degree of integration was necessary and largely achieved. The personal observations of those within the project highlight how the planning and design problems were identified and ultimately resolved.

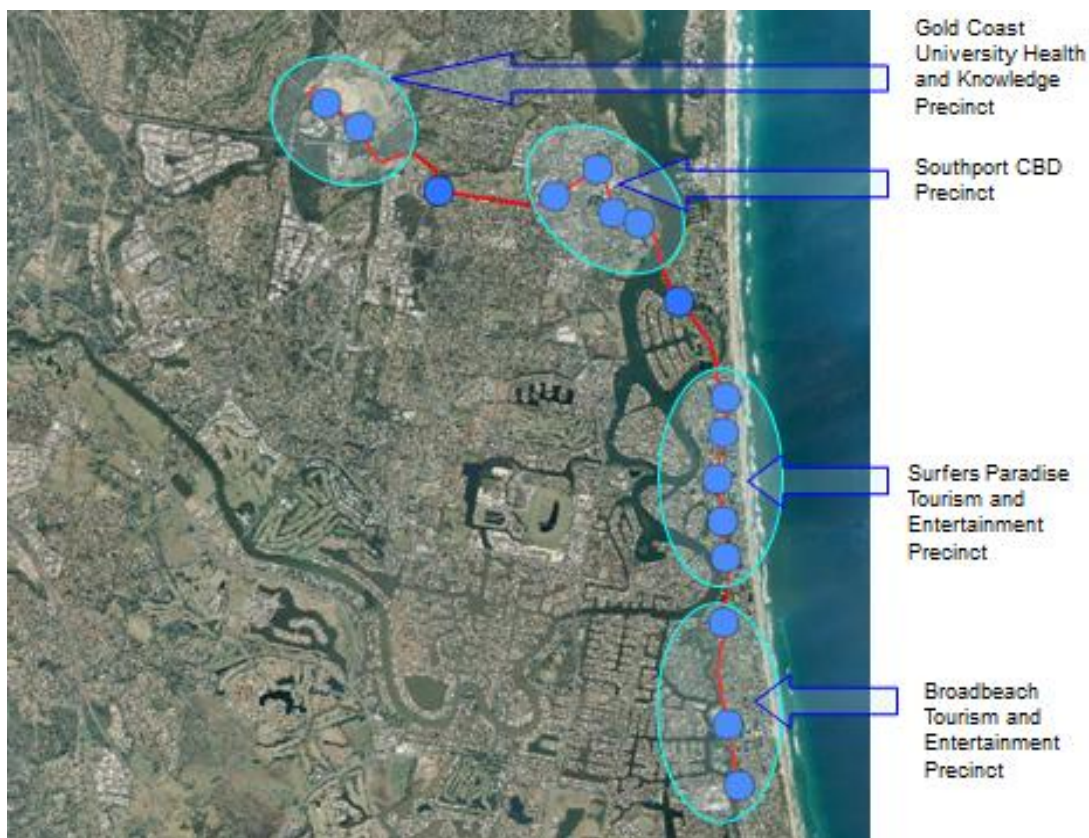


Image 1.2 Gold Coast Rapid Transit - Route and Station Locations

1.6 The Theoretical Framework for the Thesis

Whilst the idea of integrating land use and transport outcomes is increasingly accepted as the 'sensible' approach it is worth noting that the acceptance of this idea has been contentious; note this anecdote by Chris Mosey, from his book *Car Wars* (2000, p. 88):

Sir Alastair Morton, who at the time of writing is head of the Strategic Rail Authority, recalls, "I know two senior civil servants who were present at meetings with Margaret Thatcher, which she physically terminated by getting up and leaving when the words 'integrated transport' were mentioned. To her it sounded Marxist. Nutty!"

The two key concepts, MASC and RASL, are put forward as key enablers for an integrated transport/TOD solution. What is less clear is how these enabling factors are determined. The issue of the transit planning process that shapes these enablers is either ignored in the policy and the bulk of the literature or treated as neutral.

This research explores the significance of the transport/transit planning process. To the extent that a process is evident, it can be described as overtly modernist, that is a narrow, siloed, specialised planning approach that subordinates land use to the transport objective, leading to an inevitable outcome – 'transit oriented development'. Table 1.1 below provides a summary of the key ideas from the literature under the main research question: How do TOD objectives influence the urban transit planning process and outcomes. The sub research questions then structure the research.

Table 1.1 Theoretical Framework – Developed from the Condensed Literature Review Findings

	Sub RQ1 How does transit shape the urban environment and TOD objectives in the corridor?	Sub RQ2 How does the institutional structure and process shape the project and enable integrated transport planning and TOD outcomes?	Sub RQ3 How are Mode and System Characteristics shaped by TOD objectives?	Sub RQ4 How is the Route and Station Location shaped by TOD objectives?	Research conclusions
Existing Knowledge	Transit corridors as impermeable edges and a barrier to ped access and TOD	Tends towards modernist, siloed, specialised, with narrow transport planning focus.	Values transport/mobility speed and time efficiency	Requires segregated right of way. Transit corridor creates barrier to access	TOD: Development is oriented to the transit objective. lower integration and lower yield land use.

1.7 Original Contribution

In spite of a significant body of knowledge on TOD there is a notable gap between the aspirations for TOD and real TOD outcomes in Australia and especially in SEQ. The knowledge, and the policy, is focussed on the land use planning and urban design activity rather than the transit planning process and outcomes. An understanding of the way in which transit planning may enable (or disable) TOD is important at a time when many cities are currently advocating for, planning, designing or constructing new urban transit systems and doing this with a view to achieve improved land use integration and TOD.

This exploratory research provides an insight into the transit planning process and outcomes as a key factor in the enabling of integrated land use and TOD. The research examines the way in which TOD is framed in the theory, policy and the project documentation and then explores how TOD is actually enabled by the planning process.

This research explores how individuals from different levels of government and professional groups worked to shape the MASC and RASL as key TOD enablers, in a planning process usually dominated by one organisation, one profession and one set of planning objectives.

This research contributes an alternative view of the transit/land use planning relationship and a challenge to the modernist notion of integrated land use as described by 'Transit Oriented Development'. Instead it offers the idea of a balanced transit/land use planning process that can be described as "Development Oriented Transit".

1.8 Structure of the Thesis

The thesis is structured to develop key ideas from the literature leading into the method and the analysis and synthesis of the data. Chapter One provides the thesis overview, starting with the background and problem statement, explaining key definitions, outlining the focal theory and research questions, introducing the research method and details of the case study and the theoretical framework for the thesis.

Chapters Two and Three review the relevant literature addressing the research question. The chapters are structured to align with the four sub research questions.

Chapter Four details the research method and explains the rationale for the single case study as an exploratory, theory building form of research.

Chapter Five provides the analysis of the documentation with a focus on regional planning policies and the transit project documentation to set the context for the interview data.

Chapter Six analyses the narrated content from the in-depth interviews with those who have shaped the GCRT. The data are organised and analysed according to the research questions.

Chapter Seven synthesises the literature, policy and project documentation and the interview evidence to confirm the original contribution. It then goes on to outline the application of learnings and future research questions arising from this investigation.

There are a number of documents and key resources attached as appendices, including Appendix G which provides a detailed summary of the transcribed interviews so that content in the body of Chapter Six can be considered in its context.

Chapter 2 - Literature Review #1 – Transitioning to TOD

2.1 From Transit to TOD to Development Oriented Transit - Overview

Whilst there is a considerable body of primary and secondary literature dealing with transit, integrated land use and transit oriented development there is not a proper consideration of the relationship between the transit planning process and the key TOD enablers, specifically the mode and system characteristics (MASC) and the route and station locations (RASL).

This literature review explores the key ideas and research to understand the way in which integrated land use and TOD objectives influence the urban transit planning process and outcomes. The review is structured according to the research questions over two chapters. Chapter Two is focussed on the idea of transit planning ‘transitioning’ to TOD. Chapter Three deals with the transit planning enablers: how the Mode and System Characteristics (MASC) are shaped by TOD objectives and how the Route and Station Locations (RASL) are shaped by TOD objectives.

The literature review draws on a number of data sources, for example:

- academic journals, including *Journal of the American Planning Association*, *Urban Studies*, *Transportation Studies* and *Transport Policy*;
- the published works of established TOD and New Urbanist authors, including Cervero (2003), Calthorpe (1993), Dittmar (2004), and Duany and Plater-Zyberk (1994);
- internationally recognised transport planning academics, including: Wegener, Newman, Kenworthy, Currie, Giuliano, and Bertolini;
- government transport planning bodies, i.e. Queensland Transport, USA Federal Transportation Authority and UK Department for Transport;
- significant web resources, i.e. university research, conferences, advocacy groups, business groups, government and community;
- transit research bodies, i.e. Transit Cooperative Research Program, Public Transport Executive Group, the European Rail Research Advisory Council, World Transit Research, Centre for Transit Oriented Development; and
- relevant published Masters and PhD research.

This review of the literature confirms and consolidates the existing knowledge and relevant ideas dealing with the relationship between transit and the urban environment and the associated issues relevant to the research questions. It also highlights a gap in the thinking and the research around the relationship between the transit planning process and TOD.

2.2 From Integrated Transport Concepts to TOD

The growing interest in new urban transit and sustainable planning in Australia highlights the need to move beyond a narrow, modernist approach to transport planning and even integrated transport planning. The idea of 'integrated transport' is well established, if not always well defined, in the Australian TOD policy documentation but the term is not necessarily used to mean land use integration. The focus is mainly on the inter-relationship between transport systems rather than external land use/development outcomes.

Wegener and Furst (1999) provide the 'Land Use Transport Feedback Cycle' in Image 2.1 below to explain the accessibility – land use – activities – transport system relationship. The feedback relationship shows that:

- the distribution of land uses determines the location of human activities;
- the distribution of human activities requires transport trips between activities;
- the distribution of infrastructure in the transport system creates accessibility; and
- the distribution of accessibility co-determines location decisions and therefore results in changes to the land use system.

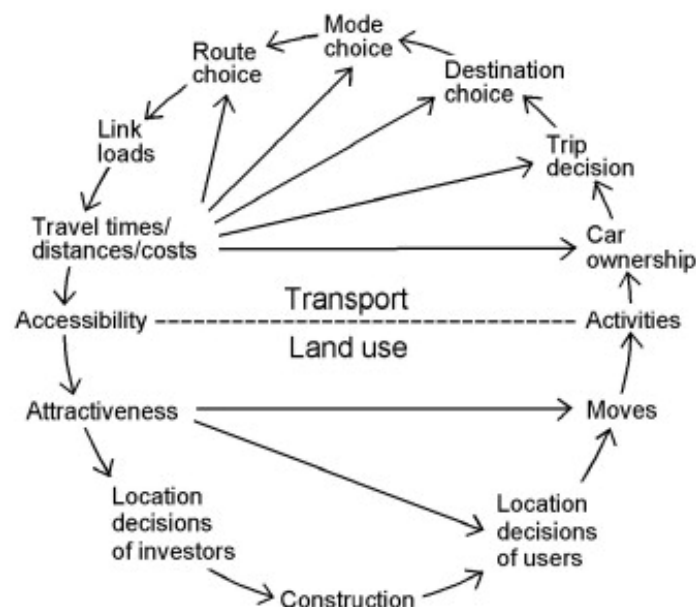


Image 2.1 The Land Use Transport Feedback Cycle (Source Wegener and Furst (1999))

The feedback cycle highlights a key problem in the modernist transport planning logic. A siloed approach tends to ignore the wider impacts of transport in the urban environment. It is notable that the idea of integrated transport often fails to consider land use impacts.

Hull (2005) considers the UK transport policy experience and identifies types of transport integration: voluntary partnerships, integrated fares and timetables, modal integration, the use of pricing to encourage energy efficiency, coordination of disparate decision making organisations, the integration of mobility and accessibility as core elements of management and design, and finally, the integration of policy measures to create a unified vision of transport, urban design and land use. Malmö, in Sweden is cited by Hull as a successful example of integrated transport policy within the context of sustainability and a culture of environmental legislation over the past decade although Hull does not emphasise land use planning and urban design outcomes (Hull 2005), highlighting land use as only one of many approaches to transport integration, and the most complex to realise.

The European Union has considered the inter-relationship between transport and land use. Their studies confirm the importance of land use policy to realise sustainable urban transport outcomes and find that integrated transport, used with land use strategies, is more successful than individual policies in either field (Wegener and Furst 1999, p. 5).

The European Commission's 2007 *Thematic Strategy on the Urban Environment* lists good practice examples of integrated land use and transport planning in European cities. These include: improving public transport, new public transport oriented developments, mixed use development, redevelopment of inner city brownfield sites, walking and cycling strategies, information, pedestrian and cyclist friendly urban design, car free new developments and inner cities, parking regulations, road user charges, and reallocation of existing public and road space (Wegener and Furst 1999, p. 6).

Cascetta and Pagliara (2007), reviewing the Naples and Campania area Regional Metro System (RMS), note the interdisciplinary nature of projects in Italy supported by planners, engineers, architects, and urban designers. They find that while there is a consensus about the need to coordinate land use and transportation planning and TOD, "land-use and urban planning are often uncoordinated, if not contradictory, with transport-related choices"

(2007, p. 1). They detail five interaction types between the transport planning process and land use in relation to the RMS project:

1. Changes in activity location and land values close to stations - The RMS increased land value in the walk up area to stations, higher than that for the wider area, reflecting changes to land use from residential to commercial activities related to the improvement in accessibility.
2. Contribution of the station to the 'urban quality' of the surrounding area - The architectural quality of stations is oriented to a positive impact on the urban environment with a focus on urban renewal. Stations are seen not only as a transport node but also as a location.
3. The 'branching out' of the rail network to connect existing major concentrations of activities - The rail system is seen as a structuring factor in the urban environment connecting established settlements and activities, working towards the creation of a multi modal infrastructure network of integrated systems.
4. The location of new activities around existing lines/stations – The authors note that "as a crucial element of the overall strategy, land use planning, both at the city and regional scale, is oriented at the existing and planned railways network" (2007, p. 9). This is achieved through higher zoning at stations with major traffic generators, such as a new university campus located close to stations.
5. The proposal for new area development plans in connection with infrastructure developments - The authors note how the above approach culminates in major urban transformations and cite the example of an industrial site planned to be transformed into a mixed use tourism, leisure and high tech industrial activity area. A new light rail system is also proposed to increase internal connectivity on the site. (Cascetta & Pagliara 2007, p. 6)

Understanding the relationship between the transit node, place and development is a feature of the node-place model of Bertolini (1999, 2011) which informs the development potential of a station precinct based on a series of quantitative measurements of the station node and place (2011, p. 57). Bertolini has applied the model to rail stations in Amsterdam (1999) and in Tokyo (2011).

In the case of Tokyo the model determines a node value for each station based on the number and type of train connections, the proximity to the CBD by rail and the number of bus lines departing from the station (Bertolini & Chorus 2011). The place value is based on six criteria: the population around the station and the degree of multi-functionality of the station and four specific economic clusters determining types of use (2011, pp. 48-50). The data is mapped to show 'balanced' stations and those 'out of balance', for example, it shows strong node/weak place or weak node/strong place. It also shows 'stress', where the

node/place has exceeded its full potential and may be prone to conflict, or 'dependence' where the node/place is undeveloped and where there is minimal conflict over space.

The Tokyo example, with its vast system of some 2000 kilometres of rail lines, mainly built by private companies, provides an interesting and relevant approach to integrated transport and TOD. Cervero notes that these transit companies profit not only from rail patronage but from the investment in real estate around the station (Cervero 1998, p. 193) and investments in rail related activities including transport services, retailing, leisure and recreation, housing, office space, and hotels (Cervero 1998, p. 191).

It is evident that realising integrated transport and land use requires a view well beyond the transportation objective but land use objectives may be contradictory to transit objectives; this is the mobility - accessibility trade off. It is also evident that different agencies and levels of government, siloed with different aims and objectives, may be unwilling and unable to align their policy objectives. The integration of transit and land use poses particular challenges but it is evident from the examples here that there are also benefits.

The literature reflects an evolving view of integrated transport and land use transcending a siloed, modernist transport practice to realise wider benefits consistent with TOD and starting to highlight the alternative approach of Development Oriented Transit (DOT).

2.3 From TOD to Development Oriented Transit

The idea of Transit Oriented Development (TOD) comes out of the contemporary 'Smart Growth' planning movement and the related place and urban design focus of 'New Urbanism', (Duany, Plater-Zyberk 1994; Katz 1994; Calthorpe 1993), which emphasise a return to traditional urban forms based on the integration of transit and land use.

As discussed, TOD is based on a 'transit oriented' approach to planning. The land use development is by definition oriented to the transit planning decision. An alternative view of transit and land use integration, and one that evolves through this thesis, is to think of the relationship not as 'transit oriented' but rather as 'development oriented' as in 'Development Oriented Transit' or DOT. The term DOT is used in this thesis to describe a transit planning process rather than a land use outcome, as is the case with TOD.

The term DOT has been used by Dittmar and Ohland (2004) to refer to the original transit communities where developers built in the transit upfront to serve the community as a key element in the promotion of the community (Dittmar & Ohland 2004, p. 5). The term is also used by GB Arrington (2007) who provides a check list for DOT which considers the transit planning process and asks:

- if the station is located in an area with development potential;
- if the design allows for pedestrian connections;
- is the transit well connected into the community; and,
- is TOD incorporated into the design?

For Arrington (2007) the planning focus is on the station node emphasising the pedestrian environment, new investment, balanced parking, tamed traffic, and connectivity with other transit. He notes the need to design the transit stations to serve as the hub of the community and to provide a local identity (Arrington 2007), in this respect he touches on the value of the transit planning process that is developed in this thesis. The idea of DOT can be seen to fit comfortably with the early seeds of TOD found in New Urbanist writings.

In *The New Urbanism: Towards an Architecture of Community* (1994) edited by Peter Katz, New Urbanism (NU) is discussed by exponents including Peter Calthorpe, Andres Duany and Elizabeth Plater-Zyberk. NU provides for “compact and walkable close knit communities as opposed to catastrophic rural dispersion” (Katz 1994, p. ix). Katz notes that the car has fragmented society and the broken down social bonds, (Katz 1994, p. ix). The NU solution is a return to community, one empowered by the opportunities offered by new technology such as telecommuting and reducing the need to drive (Katz 1994, p. ix).

Andes Duany and Elizabeth Plater-Zyberk (1994) note how ideas about the industrial city continue to shape the modern city: “it is this separation of social functions: dwelling, work, school, worship and recreation that has reinforced car ownership and use” (Duany & Plater-Zyberk cited in Katz 1994, p. xx). NU instead promotes compact mixed use and pedestrian friendly neighbourhoods. Duany and Plater-Zyberk (1994) state three fundamental organising elements of NU: the neighbourhood, the district and the corridor. The corridor is addressed in relation to its “public space function, being universally used and providing connection and mobility”. The corridor is both the connector and the separator of

neighbourhoods. It is an urban element characterised by its visual continuity. The corridor might be natural such as in wildlife trails or man-made such as rail lines and is defined by its adjacent districts and neighbourhoods and provides entry to them. In relation to transport, the corridor features are noted as variable depending on the mode:

The heavy rail corridors are tangent to towns and traverse the industrial districts of cities. Light rail and trolleys may occur within a boulevard at the neighbourhood edge. As such they are detailed for pedestrian use and to accommodate the frontages of buildings. Bus corridors can pass through neighbourhood centres on conventional streets. (Duany & Plater-Zyberk cited in Katz 1994, p. xx)

The New Urbanists have challenged modernist ideas about the transit and land use relationship and have redefined the debate about sustainable urban planning. The key contributors to NU and TOD include Peter Calthorpe, Robert Cervero, Hank Dittmar, Peter Newman, and GB Arrington; their ideas on TOD are discussed below.

2.3.1 TOD in the 1990s

A significant early work on TOD is *The Next American Metropolis – Ecology, Community, and the American Dream* (1993) published by architect and planner Peter Calthorpe with Shelley Poticha. Calthorpe had previously published *Sustainable Communities* (1986). His ideas draw on a considerable body of planning and design work including the TOD design guidelines for San Diego in 1992, provided to complement that city's new light rail, and it was the first city in the United States to do so (Dittmar 2004, p. 213).

In *The Next American Metropolis* Calthorpe points to the way in which post-war American values and aspirations are reflected in the American metropolis; in the low density suburbs and the car oriented sprawl. Calthorpe lays out an alternative planning philosophy based on traditional values but with a concern for sustainable development and he illustrates these ideas through various planning concepts. Calthorpe states that his ideas are influenced by Ruskin's City Beautiful Movement, Sitte's medieval urbanism, the Garden Cities of Europe, Jane Jacobs and Leon Krier (Calthorpe 1993, p. 15). *The Next American Metropolis* provides a vision based on early twentieth century American planning values; the walkable transit towns and places, and it is from these values that Calthorpe develops his principles for TOD:

- Organise growth on a regional level to be compact and transit supportive;

- Place commercial, housing, jobs, parks, and civic uses within walking distance of transit stops;
 - Create pedestrian friendly street networks which directly connect local destinations;
 - Provide a mix of housing densities, types and costs;
 - Preserve sensitive habitat, riparian zones and high quality open space;
 - Make public spaces the focus of building orientation and neighbourhood activity;
 - Encourage infill and redevelopment along transit corridors within existing neighbourhoods.
- (Calthorpe 1993, p. 43).

Calthorpe's designs are rail based but he argues that rail or bus can produce TOD, albeit at different scales and outcomes (Calthorpe cited in Dittmar 2004, p. xii). He argues that the entire region should be designed according to similar urban principles, "it should be like a neighbourhood, structured by public space, its circulation system should support the pedestrian, it should be both diverse and hierarchal and it should have discernible edges" (Calthorpe 1993 cited in Katz 1994, p. xi).

Calthorpe's transport philosophy is rooted in the capacity of the urban environment to provide connectivity and accessibility. For Calthorpe the street is "a place to walk, a place to bike, a place for kids to play, a place to park cars, a place for trees, and therefore a place for birds. To think of the street as just a utility for cars is just so absurd." (Scott London, interview with Calthorpe, 2002).

Calthorpe considers the function of transport barriers and boundaries. He emphasises arterial roads and thoroughfare streets so that they form discernible edges to the TOD and this is evident in many of his designs. He argues that arterial roads, in new growth areas, should be located to maximise the potential size of TODs and to avoid bisecting viable sites. Convenient crossings for pedestrians and cyclists should be provided where arterial roads cross but these should be at grade and pedestrian crossings that are under or over the road should be avoided unless absolutely necessary (Calthorpe 1993, p. 98).

Regarding the location of transit lines and stations Calthorpe emphasises the issue of density, opportunities for redevelopment and pedestrian quality and nodal rather than strip development to maximise accessibility around transit stops. Streets should be located so that they take people to the stop (Calthorpe 1993, p. 106) however Calthorpe's visual work does not indicate the detail of crossing at or through the transit station and corridor.

Calthorpe finds that in practice transit lines are often located where they do not support density and are more likely to be dominated by park and ride. He considers the way in which existing rail and freeway rights of way determine the route of fixed rail transit lines and some of the opportunities that may arise from this including redevelopment and infill as well as the challenges, for example, the freeway corridor environment is unlikely to support TOD style development so that park and ride at stations may be more appropriate in these locations (Calthorpe 1993, p. 104).

The Next American Metropolis provides a design philosophy that is strongly oriented to the needs of the pedestrian; however the transport generated barriers to pedestrian movement are dealt with only in passing. It is unclear from reading and studying Calthorpe's design drawings how permeable these transit lines and stations are intended to be. Calthorpe's plans provide a bird's eye view of the urban environment rather than a pedestrian eye view. He recognises the way in which the transit corridors are poorly located and the significance of this but does not delve into or challenge the thinking behind this.

The Next American Metropolis has arguably redefined American ideas about the integration of transit into the urban environment. Calthorpe emphasises a vision for diversity, pedestrian scale, public space and the structure of bounded neighbourhoods and connects this vision into traditional transit and pedestrian focussed planning values. *The Next American Metropolis* (1993) establishes a body of important ideas however the problem of transit route and station location planning and design is not resolved in this work.

Transit Villages in the Twenty-First Century by Michael Bernick and Robert Cervero (1997) provides a five part journey from the early twentieth century American transit village through to contemporary examples of "transit villages in the twenty-first century". Like Calthorpe their inspiration is drawn from the idea of the traditional American town and place and this provides the context for the idea of the modern transit village. Their work notes the "current rail renaissance" with the opportunity to provide new mobility and lifestyle through the transit village concept (Bernick & Cervero 1997, p. 13). The authors provide three dimensions for the successful transit village, the 3D's: *density* to ensure a reasonable walking distance to transit, *diversity* to ensure a mix of land uses, and *design* to support walking, cycling and transit (Bernick & Cervero 1997, p. 73).

The case studies range from the boutique Mockingbird Station to the monolithic Lindburgh Centre. It is evident from the case descriptions that the transit edges that define these developments are also significant barriers for local pedestrian access with major rail and road barriers hemming in the developments providing an interesting accessibility dilemma.

Transit Villages in the Twenty-First Century highlights the relationship between the built environment and the demand for transit and in this it highlights urban design factors and the quality of the pedestrian environment. The authors also highlight the connections between transit villages/transit oriented development and the wider body of design work on public spaces and neighbourhoods. Like others they note the development constraints with poorly located transit lines and stations but do not consider how or why this occurs, even with new transit projects.

2.3.1 TOD in the 2000s

In the 2000s the idea of TOD can be seen to have developed with a wider view of the enabling factors for TOD. *The New Transit Town* (2004), edited by Dittmar with Gloria Ohland, provides a wider view of TOD, looking beyond the planning and design focus of Calthorpe and Cervero with a range of individual contributions dealing with finance, planning scheme policy and issues of parking and traffic: issues identified as barriers to TOD.

Dittmar and Ohland (2004) argue that the term 'Transit Oriented Development' should be reserved for projects that achieve the following performance-based definition of TOD:

- Location efficiency – the conscious placement of homes in relation to the transit system – includes affordability, density and pedestrian accessibility;
- Rich mix of choices – so that the neighbourhood provides many activities within walking distance – includes convenience, choice, a range of housing options;
- Value capture – recognising and capturing the economic value and improved affordability associated with good urban design;
- Place making – ensuring that the TOD functions as an attractive and pedestrian friendly place – includes some density and interconnected streets;
- Resolution of the tension between node and place – the station/transport function may provide a barrier to pedestrian movement but the design of the TOD must ensure precedence for walkers over other modes. (Dittmar & Ohland 2004, p. 22).

Dittmar and Ohland (2004, p. 22) emphasise the importance of place and argue that place making may be as important to the success of TOD as access to transit. The English

Partnerships (2000) publication, *The Urban Design Compendium*, is cited here as a key working document emphasising places that are “well used and well loved” (Dittmar and Ohland 2004, p. 31). The themes here are to enrich the qualities of the existing urban places, connecting places physically and visually, ensuring balance between the man-made and the natural environments, providing different building forms, uses, tenures and densities, ensuring that they are commercially viable, well managed and well maintained, and ensuring flexibility of design to respond to future changes in use, lifestyle and demography (Dittmar and Ohland 2004, p. 31).

Dittmar and Ohland (2004, p. 32) point to the way in which the node and place tension may be a challenge for achieving TOD, this includes the desire for more parking versus the access needs of pedestrians. The transit /place tension arises from the different needs of people: the time focussed non-social behaviour of those on the move versus those who are not; those seated, relaxing, socialising. These differing needs result in differing urban design challenges which need to be acknowledged and reconciled in the TOD design.

Dittmar and Ohland emphasise walkability as a key theme in the essence of TOD “at the heart of TOD is the pedestrian” (2004, p. 32) and it is evident that realising this objective remains a problem with so-called TOD development in the United States. Dittmar and Ohland (2004) point to the difference between TOD and “Transit Adjacent Development” where auto oriented development simply adjoins the station. Sharon Feigon, David Hoyt and Gloria Ohland (2004) writing in *The New Transit Town* discuss the TOD experience in Atlanta and find significant investment in high density development with some mixed use around stations, but this development was not integrated into surrounding communities and with almost no pedestrian or streetscape improvements to link up to transit (2004, p. 186).

Dittmar and Ohland have looked beyond the earlier work on TOD which has tended to focus on planning and design issues to explain the enabling of TOD. The breadth of the subject matter reflects the complexities of higher density, mixed use development with its higher risk and uncertainty compared to the conventional single use development practice that is well understood by government and developers.

Dittmar and Ohland refer to the relationship between the original street car suburbs and the transit system and in this they use the phrase “development oriented transit” to highlight the practice of early land developers who constructed the early transit systems to add value to their real estate developments (2004, p. 4). They have not however developed this idea in detail to consider the contemporary barriers between transit planning and TOD.

There has been a growing body of TOD in the Australian context. The work of Graham Currie (2005, 2006a), Carey Curtis (2008a, 2008b, 2009, 2010, 2012a, 2012b) and Peter Newman (2005, 2006, 2007b, is notable. The work of Currie is particularly relevant in the discussion of mode factors while Carey’s work is focussed on governance and TOD policy matters; these are dealt with in later sections. The work of Newman is specifically relevant to this section.

In his paper *Planning for Transit-Oriented Development in Australian Cities* (2007) Peter Newman outlines four characteristics of successful TOD: (1) a strategic policy for centres, (2) to connect those centres by rail, (3) a statutory planning base that ensures appropriate density and design, and (4) public and private funding mechanisms tied to land development that funds the transit (Newman 2007, pp. 1-7). Newman applies these characteristics to Australian capital cities and notes that TOD has occurred occasionally in Australian urban development but lacked strategic or statutory planning (Newman 2007).

Newman’s strategic policy framework emphasises economies of scale and density which support transit and reduce car dependence. He argues for density targets at thirty-five people/jobs per hectare for a sustainable transit oriented town centre. This figure is one that has been tested by Newman and others over time and in different places and has continued to hold firm. Based on a ten minute ‘ped shed’ with around three hundred hectares at thirty-five people per hectare there would be a threshold of approximately 10,000 residents plus jobs in the walk up area (Newman & Kenworthy 2006, p. 43).

Newman (2007) argues for a statutory base for the necessary densities and design and this initially requires a regional planning approach with a public/private financing mechanism that ties the transport objective to the land use objectives:

A state government building a rail line entirely as a transport proposition can mean that it is optimised around rail operations without any consideration for the linking of centres or building of TODs. This has mostly been the history of rail development

in Australia and the US in recent years. However if the private sector were to build rail in partnership with government with land development financing, rail would automatically be integrated with land use as a function of its funding.... Thus public-private funding arrangements for rail are likely to be an inherently more effective way of creating TODs than state funding alone. (Newman 2007, p. 7)

Newman blueprint for rail and TOD provides a broader justification for its need and a more sophisticated environment for its delivery. His ideas are consistent with the successful TOD policies noted earlier from Europe and Japan and highlight the need to address the wider issues and benefits for TOD. Newman's work is notable in that there has been very little serious in-depth research into the transit/land use/TOD issues in Australia.

In considering the evolving practitioner experience the work of GB Arrington is relevant to this research. Arrington is a leading TOD practitioner in the United States, based in Portland, Oregon, who has informed the development of TOD around the world including the 2004 Gold Coast Light Rail - Feasibility Study (note Chapter 5 for a review of this study).

The Urban Development Institute of Australia describes Arrington as "the world's foremost authority on TOD policy, design and implementation" (Congress for New Urbanism Website 2012). Arrington oversaw the plan to transform Tysons Corner, Virginia, from a car oriented centre into America's largest TOD and in 2011 this was recognised by the Daniel Burnham Award, the American Planning Association's most prestigious prize (Congress for New Urbanism Website 2012).

Arrington goes beyond the norm to argue specifically for improved design in transit planning to support better station places and TOD outcomes. In his blog he states:

Over the past decade more than \$75 billion in public dollars has been invested in rail transit. Los Angeles, Seattle and Denver alone are investing an additional \$65 billion to expand their systems and enhance the liveability of their communities. The federal government will be asked to play a major role in funding each of those systems. Up until now the federal role in major transit investments has largely avoided the question of how we ought to design our transit systems to be good neighbors and leverage liveable communities. (Arrington 2010)

Arrington calls for transit planners to get beyond the "transit facility design playbook" and for the federal funding program, 'New Starts', to look beyond traditional concerns for issues of financial capacity, ridership forecasts, and user benefits. He argues that good design,

independent of mode, is able to capture economic development, environmental, land use and mobility benefits. He points to the success of Portland in transit design and \$11 billion in TOD related benefits achieved through better route and station locations, reflecting the intent of the TOD policy (Arrington 2010).

Expanding on his ideas in an interview with the author in April 2011, Arrington states:

I think too often that we accept transit at face value as a public good and that the transit does not have to do anything different because it is not a freeway, so it is a good. Unfortunately conventional transit is designing transit around the automobile and it is not designing transit around building communities so you need to change how you design transit so that it is different. When you get to TOD, TOD is about the walkable precinct around that Development Oriented Transit, and the walkable precinct is the 5 to 10 minute walk. (GB Arrington 2011 pers. comm., 1 April)

Arrington goes on to note the challenge of modernist transit planning practice and its tendency to design for the car, hence the frequency of park and ride around transit stations. He points to the need to move towards DOT and the emphasis on route and station locations that support walkable and accessible communities.

The idea of TOD is well developed however the less obvious idea of Development Oriented Transit yet to be properly examined. A clear challenge with DOT is to address an established and modernist transit planning process and the key planning enablers within that process.

2.4 Delivering Integrated Transport and Land Use Outcomes

Integrated transport and land use planning at the beginning of the twenty first century is an idea in the ascendency, consistent with increased interest and investment in urban transit and with recognition of the opportunity to realise sustainable urban planning outcomes. The trend points to the subject of this section, a transport planning philosophy and practice that transcends narrowly focussed modernist practice.

Light and heavy rail systems constructed in the mid to late 1800s transformed the shape of cities, increasing their size and the mobility of their populations. Sixteen Australian cities operated tramways up to WWII but after this period the urban tram was seen as redundant:

During those years and the 1960s Australia went on an obscene orgy of destruction, tearing its cities apart and destroying much of its heritage in the quest for so called modernity. (Brimson 1983, p. 14)

Since the 1980s there has been a renewed interest in transit. Urban Bus Rapid Transit (BRT) and Light Rail Transit (LRT) projects have been completed in most Australian capital cities in recent decades with more projects in the planning stage. Not one Western European country opened a light rail system in the 1970s but in the 1980s and 1990s twenty-one systems were opened. Similarly, in North America, only one light rail system opened in the 1970s but in the 1980s and 1990s twenty-one systems opened (Taplin 2011). As of 2002 new LRT systems were being built in thirty-five European Union cities with plans for new or extended systems in a further seventy-four cities. According to the European Rail Research Advisory Council business scenarios, LRT track length will double, with a 50 per cent increase in the number of LRT systems in Western Europe by 2020 (ERRAC 2002).

The urban transit renaissance underpins a rethinking of the transportation problem in cities. Muller (2004, p. 83) notes “there is considerable evidence that building new expressways does not improve the flow of traffic ...” and goes on to note that the building of new public mass transit systems has been pursued as an alternative to more highways and as a possible solution to urban transportation problems (Muller 2004, p. 83).

The road/highway oriented planning and delivery method raises questions about the way in which the planning/delivery process influences transit planning outcomes and the role of professions beyond engineering, such as land use planning and urban design and how they are integrated into the transit planning and delivery process.

A key issue here is the influence of post war modernism in planning. Beauregard (1996) points to four ways in which modernism has shaped planning: (1) to bring reason and democracy to bear on capitalist urbanisation, (2) to guide state decision making with technical rather than political rationality, (3) to produce a coordinated and functional urban form organised around collective goals, and (4) the use of economic growth to create a middle class society (Beauregard 1996, p 108).

Modernism has remade the form and function of the traditional city; this is evident in a built form with “an entrenched anti-city ethos”, the separation of day-to-day activities and the

dominance given to car mobility (Dewar 2011, p. 964). This separation and specialising of transport planning policy and practice with the siloed bureaucracies for transport and land use planning have become barriers to integrated planning outcomes.

Natrasony and Alexandra (2008) discuss three key tenets of the Fordist paradigm - specialisation, mass production and standardisation and they consider how these factors have shaped city building from the beginning of the twentieth century, being largely responsible for the sprawling pattern characteristic of North American suburbs. In this process the practice of planning has become mechanised:

Planning practice changed from a kind of craft based on personal knowledge of a rudimentary collection of concepts about the city, into an apparent scientific activity in which vast amounts of precise information were garnered and processed. (Hall 1988, p. 317 cited in Natrasony & Alexandra 2008, p. 5)

The professional division between land use planners and urban designers on one hand and civil engineers and transport and traffic planners on the other is characterised by entrenched professional knowledge and practices with different ways of understanding the problem to be solved. According to Calthorpe and Fulton:

We plan and engineer rather than design. Engineering tends to optimise elements without regard for the larger system, whereas planning tends to be ambiguous, leaving the critical details of place making to chance. If we merely plan and engineer, we forfeit the possibility of developing a 'whole systems' approach of a 'design' that recognises the trade-offs between isolated efficiencies and integrated parts. (Calthorpe & Fulton 2001, p. 43)

Engineering is an established profession with entrenched values, beliefs and practices focussed on four broad disciplines: chemical, civil, electrical, and mechanical engineering, with specialised branches within each discipline (Engineers Australia 2011). Civil engineering is the dominant stream dealing with transport planning. Engineers Australia describes the role of the transport engineer as follows:

Transport engineers design, test and improve systems and structures used to move people, cars, trains, airplanes and ships. For example, it is vital that traffic intersections are designed in such a way that traffic flows freely and does not cause unnecessary congestion. The layout of train lines needs to be designed with similar objectives in mind. Transport engineers also plan future travel needs of city and country areas as populations increase and needs change. (Engineers Australia 2011)

Alternatively, land use planners may be focussed on the local through to the regional and consider social, economic and environmental outcomes. They tend towards a holistic view of the planning problem. According to the Planning Institute of Australia (PIA):

Planning is the process of making decisions to guide future action. The planning profession is specifically concerned with shaping cities, towns and regions by managing development, infrastructure and services.

Planners are professionals who specialise in developing strategies and designing the communities in which we live, work and play. Balancing the built and natural environment, community needs, cultural significance, and economic sustainability, planners aim to improve our quality of life and create vibrant communities. (PIA 2007)

The professions each have an interest in the way that transport and transit shapes the urban environment but do so in different ways and from different perspectives. There are also other professionals concerned to achieve urban design, local economic and community development and social planning outcomes who have an interest in the planning and design of transit and its integration into the urban environment. A question arises as to how and when these professionals become involved in the transit planning process and how the process might evolve to accommodate a broader range of interests.

Rodrigue et al. (2006), in *The Geography of Transport Systems*, note the challenge for transport planning; that the field has for a long time been dominated by traffic engineers:

... who gave it a distinctly mechanistic character, in which the planning process was seen as a series of rigorous steps undertaken to measure likely impacts and to propose engineering solutions. (Rodrigue et al. 2006, p. 298)

The tendency has been to deliver transport within a narrowly defined view of mobility, focussed on increasing speed and with consequences for other urban activities. Paul Virilio, a theorist of technology, makes the argument that “the contemporary world is shaped by a logic of increasing speed” (Butler 2008, p. 472). Increasing journey speed has been the imperative that has driven progress for decades, if not centuries (Lyons & Urry 2006, p. 1), so transportation planners have therefore engineered systems that seem “coded to seek low-cost speed to enable individuals to maximise range” (Hanson & Giuliano 2004, p. 5).

The modernist approach to transport planning with its narrow focus on speed/time efficiencies can be contrasted with an evolving approach to transport planning which

employs multidisciplinary strategies to meet a range of objectives such as health and safety, lower vehicle emissions, improved equity, enhanced economic development opportunities, improved community liveability and promoting mobility (Rodrigue 2006, p. 299). The focus is on managing transport demand and the need for accessibility, with mobility rather than simply continuing to build transport capacity.

Levinson and Krizek (2008), in *Planning for Place and Plexus: Metropolitan Land Use and Transport*, discuss the changing nature of the transport planning profession and practice and note the need for holistic thinking in examining place and plexus (plexus being the networks that connect people and places). They note the inter-relationship of transportation and location as being sufficiently interdisciplinary to warrant a discipline of its own:

We therefore think of ourselves as transportationists. This means that we are interested in understanding the transportation system holistically. However, we are also trained in land use planning and consider ourselves locationists because we seek to understand land use and location holistically. (Levinson & Krizek 2008, p. 10)

Realising integrated land use outcomes may also come down to a capacity for collaboration. TCRP Report 102, *Transit Oriented Development in the United States: Experiences, Challenges, and Prospects* highlights the challenges for TOD including the coordination of stakeholders with their range of needs and preferences:

In today's typical TOD project, the public sector builds the transit (often with the involvement of multiple agencies), local governments try to control development, and developers look for opportunities to make profits. Transit agencies also become involved as property owners in joint development projects. All of these entities—not to mention transit riders, neighbours, and the public at large—have different ideas about what the project should accomplish.... Too often, projects are implemented without a clear vision of desired outcomes, the different goals of the actors, and the ways in which those goals may work at cross-purposes and lead to a project that, while perhaps superior to traditional development, falls short of the potential of TOD. (Cervero 2003, p. 102)

In a *Transport Policy* journal editorial entitled '*Urban transportation planning in transition*', the authors note that the "persistent separation of the transport and land use planning processes" is in "sharp contrast with the nature of urban problems, which demand an integrated approach" (Bertolini et al. 2008, p. 70). The editorial argues that the "predict and provide" approach to urban transport planning is no longer an option on account of the

increasing difficulties with the reliability of predictions and the willingness to challenge assumptions on which predictions are made. Even if the predictions are correct, expanding the system to meet predicted growth is increasingly difficult (Bertolini et al. 2008, p. 70).

The transport discipline, it is argued, is in the midst of a “paradigmatic transition” reflecting new planning goals and processes (Bertolini et al. 2008, p. 72). In terms of those processes the emerging transport planning trend emphasises the importance of collaboration, integration and exchange with other professions and policy sectors. Bertolini et al. (2008) refer to the example of the Naples and Campania transit project and note that the scope of disciplinary collaboration, integration and exchange:

... goes as far as to bring together traffic engineers, transportation planners, urban designers, architects, visual artists and archaeologists; and involves in the process the worlds of politics, academia, the professions, the market and civic society. (Bertolini et al. 2008, p. 72)

The Regional Metro System in Naples and Campania emphasises an approach to rail transit and land use integration oriented to generating demand through improved urban design, architecture and urban renewal (Cascetta & Pagliara 2007, p. 1).

In Australia there has been some recognition of the need to move beyond modernist planning practice silos. The approach has tended to be on the higher level policy and bureaucratic structures rather than the planning practice.

The issue of an integrated transport and land use policy extending to integrated government departments was the subject of consideration by Legacy et al. (2009) who compare the experiences of Melbourne and Perth. Melbourne is noted for its separate transport and land use departments with different Ministers whereas Perth has an integrated structure through the Department of Planning and Infrastructure under the one Minister. Despite Perth’s integrated approach it is noted that working practices remain siloed and fragmented “hidden under the overarching organisational structure” (2009, p. 8).

Legacy et al. note that it was worrying that some sought to resolve the lack of integration in Melbourne with a reorganised structure under the one portfolio similar to the Perth model and that in fact the Perth model “may be problematic” and that it needed further

examination (2009, p. 10). Clearly structure and policy are not in themselves a panacea for over half a century of siloed planning practice.

Curtis (2012) has detailed the attempts of Perth to realise TOD outcomes and finds that “Despite a strongly integrated state agency, the relationship between state transport planners and state land-use planners has not succeeded in delivering timely TOD where improvements to rail infrastructure have occurred.” Curtis goes on to note that “For successful TOD transition, land use planning must accompany the project planning phase of transport planning infrastructure projects” (Curtis 2012, p 289).

Waddell (2011) considers the institutional barriers to integrated transit planning outcomes and points to four challenges in achieving integration. The first challenge is the integration of decision making amongst various institutions with differing and competing mandates:

Policies that might be optimal for a metropolitan region, arising from close coordination among these infrastructure and land policies, will be all but guaranteed to be sub optimal for each institution individually, given their narrower scope and constituency. (Waddell 2011, p. 211)

The second issue is that of conflicting values between institutional and non-institutional stakeholders. Waddell (2011) points to a lack of metropolitan governance in the United States and an inability to manage the political process in a democratic way. Thirdly, is the issue of conflicting or divergent epistemologies emphasising the gap between methods; the implicit knowledge versus the explicit knowledge, visioning and sketch-planning relying on participant’s knowledge and assumptions versus more scientific methods. Different methods lead to different conclusions about the problem. The fourth issue is that of conflicting policies, where one level of government presents a high level focus on integration of land use and transport whilst at another level a transport department may have a narrow focus on a single objective (Waddell 2011).

Wegener and Furst (1999) note that the urban land use and transport relationship is common wisdom amongst planners and the public, but state that the reverse impact from transport to land use is less well known. They highlight a common, but misplaced, view that the transit planning process is fixed by its rules and non-negotiable.

The land use – transport feedback cycle, (Image 2.1), provides a logical view of the land use and transport relationship and a way to understand the interactions; it is a model that also works at the micro level to explain how TOD works. Wegener and Furst (1999) find that success in sustainable land use and transport policies requires that car travel be less attractive in its cost and speed and this in part can be achieved through spatial organisation that is more compact and diversified.

They find that such policies are not detrimental to the economic vitality of city centres. They note in summary that:

If land-use and transport policies are compared, transport policies are, by far, more direct and efficient in achieving sustainable urban transport. However, accompanying and supporting land-use policies are essential in the long run for creating less car-dependent cities. (Wegener & Furst 1999, p. xix)

A narrow approach to how transport is priced and provided may distort wider outcomes. If transport costs are viewed without regard to the wider economic costs then there is a risk that the outcome will not serve the wider good.

Guiliano (2004) shows that urban transport policies and investments are implemented on the basis of transport planning and management objectives, so their evaluation is linked to their transport operations and efficiency performance, but urban transport policies and investments may have wider, direct and indirect, socio-economic effects. Consistent with Wegener and Furst (1999), Guiliano finds it difficult to examine the land use impacts of transportation because of the mutual dependency (Guiliano 2004, p. 239).

In summary this section has considered planning practice in relation to integrated transport and land use outcomes. It highlights the way in which the specialised and siloed nature of modernist planning practice is at odds with a collaborative and integrated policy making environment, planning practice and outcomes consistent with TOD.

2.5 Literature Review - Conclusions

Chapter Two has considered the literature in relation to the way in which transit shapes the urban environment. It confirms an evolving transport planning practice and a growing concern to realise integrated land use outcomes and TOD. It is also evident that the early 'traditional' approach to land use and transport planning was by its very nature integrated. The New Urbanists and TOD advocates provide a range of approaches to thinking about this and how to realise TOD and the 'green shoots' of a Development Oriented Transit practice which treats the transit planning process as an enabler of land use and TOD opportunities.

The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* The first sub-question dealt with here asks: *How does transit shape the urban environment and transit oriented development objectives in the corridor?*

Table 2.1 below summarises the literature review conclusions with the relevant section shown in brackets. The conclusions are numbered according to the specific findings from the literature review. These are then used in Chapter 7 to cross reference with the findings from the policy and project documentation and the abstracted meanings from the interview data.

Table 2.1 From Transit to TOD to Development Oriented Transit Conclusions

LR1 (2.2)	There has been an evolving view of integrated transport and land use planning that looks beyond narrow modernist transport objectives, consistent with TOD. The idea of TOD itself can be seen as a dynamic and evolving concept
LR2 (2.3)	TOD continues to be treated as a land use planning issue rather than a transport planning issue and may be at odds with transport planning objectives and practices such as 'scientific modelling'.
LR3 (2.3)	The idea of TOD can be contrasted with the idea of Development Oriented Transit which considers the TOD enabling factors within the transit planning process.
LR4 (2.3)	Transit decisions actively shape the urban environment and this is evident in the earliest transit/land use planning ideas.
LR5 (2.3)	Transit corridors determine the way in which the urban environment is accessed and are a factor in the realisation of pedestrian friendly urban environments.

The second sub-question dealt with here asks: *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?* Table 2.2 below summarises the conclusions.

Table 2.2 The Transit Planning Process and Outcomes Conclusions

LR6 (2.4)	A renewed interest in integrated land use and transport has underpinned significant investment in new urban transit systems tied to urban renewal and TOD objectives.
LR7 (2.4)	Modernist transit planning is highly specialised, siloed from other planning functions and dominated by engineering values. It tends to prioritise mobility over other objectives that are necessary to realise TOD
LR8 (2.4)	The specialised and siloed nature of transit planning is contrary to the achievement of integrated land use and TOD outcomes.

Chapter 2 has considered the impact of transport on the urban environment and local accessibility and TOD which address the first and second sub questions. Following on from this, and addressing the third and fourth of the sub questions, Chapter 3 will consider the literature dealing with the enablers for TOD in the transit planning process with regard to urban, at grade, light rail and bus rapid transit.

Chapter 3 - Literature Review #2 – The Transit Planning Enablers

3.1 Mode and System Characteristics Overview

Modern Bus Rapid Transit (BRT) or Light Rail Transit (LRT) systems are located within the urban environment in different ways, i.e. edge or centre locations, in segregated or permeable corridors, to accommodate speed, frequency, overtaking, station spacing and car parking. The mode and system characteristics (MASC) of LRT and BRT have the ability to realise specific land use outcomes.

The way in which the MASC influences land use and enables TOD outcomes is generally not well articulated or is ignored in the literature. A close study of the literature shows how Bus Rapid Transit and Light Rail Transit, produce different transport and land use outcomes.

This section reviews the literature in relation to the sub-question: *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?* This section considers MASC as a key element in the transit planning process and investigates the way that MASC shape, and are shaped by, the integrated land use and TOD objectives.

3.2 Transit Shaping TOD Outcomes

Arguments about the respective strengths and weaknesses of BRT and LRT in relation to land use integration and TOD have become less clear as the transit technologies evolve: LRT from tram and street car systems, with greater speed, comfort, capacity and quietness and bus systems which are increasingly being developed into higher capacity, higher speed BRT with buses running in segregated transit corridors and stopping at 'stations rather than 'stops'.

The Transit Cooperative Research Program (TCRP) has produced a number of research reports investigating the relationship between transit, integrated land use and TOD. In TCRP Report 102 Cervero (2004) finds heavy and light rail accounts for over 90 per cent of TOD in cities in the United States whilst only 8 per cent of TOD were bus based initiatives and these were in predominantly smaller communities (Cervero et al. 2004, p. 17). One factor is the visible and permanent nature of LRT which is related to its capacity to attract new development. It is also evident that there is a desirable relationship between the scale of the transit and that of the development (Bertolini & Chorus 2009).

Considering the success of rail transit in realising TOD, Newman (2007), in the *Built Environment Design Guide*, argues that TOD requires a “commitment to centres and a commitment to electric rail as its core ingredients” and argues that busways are being built but not with TOD in mind due to problems with the lack of speed, bunching and noise issues (Newman 2007, p. 1). Newman argues for a density of about thirty-five people/jobs per hectare as the level of activity required to shift behaviour (Newman & Kenworthy 2006).

Dittmar and Ohland (2004), in *The New Transit Town* provide an overview of TOD without a focus on the transit impacts however their TOD case studies are rail based. They do note that bus and BRT TOD can be attractive to low density communities and this fits with the notion of buses working more efficiently in lower density suburban environments (Dittmar & Ohland 2004). Calthorpe, writing in the foreword to *New Transit Town*, notes:

The original direction of TOD was limited; it focussed on light rail to the exclusion of other transit types. Now the modes have matured to include bus rapid transit There is no one best system; like the land use each generates, these systems are diverse and interdependent. (Calthorpe, in Dittmar & Ohland 2004, p. xi)

Calthorpe proposes different levels of TOD typologies reflecting the mode and the land use opportunities associated with that mode. The larger ‘Urban TOD’ is associated with rail while the ‘Neighbourhood TOD’ is associated with bus.

The literature here shows that transit is not neutral in the urban environment. The MASC shape land use outcomes. Bus tends more towards the suburban-neighbourhood TOD or park and ride outcomes, whereas rail and light rail is more firmly associated with urban TOD.

3.3 MASC and Transit Corridor Permeability

A key MASC is ‘Transit Corridor Permeability’ (TCP) which is the tendency of at grade urban transit to create an edge/barrier. Low TCP may impact on station place accessibility, limiting walkability and therefore TOD outcomes.

Levinson and Krizek (2008 p. 229) show how mobility is achieved at the expense of accessibility and through the segregation of road/transit corridors from other movements, limiting access to and from the system. Guo et al. (2001) discuss how busy roads function as barriers to local access, firstly, through the creation of dynamic severance, a result of fast

moving traffic, and secondly, static severance due to the physical barriers on and by the road. Clark and Hutton (1991) note the impact of psychological barriers for pedestrians that can arise when confronted with noise, pollution and the perceived risk of being run down.

Highly segregated at grade transit systems tend to operate in corridors located to the edge of urban centres to minimise conflicts. Whilst this improves transport efficiencies there are consequences to be noted. Currie (2006b, p. 13) found that in the Sydney BRT system the stations lacked proximity to major trip generators and had limited access paths from trip generators to stations on account of sound barriers and safety concerns.

In Brisbane, the South-East busway runs mainly beside the freeway, but closer to the CBD it runs into Melbourne Street, South Brisbane, a key pedestrian link between the CBD and inner south communities. The West End Community Association outlines these problems in a submission to the South Brisbane Renewal Strategy:

...the zone around the South Brisbane/QPAC [Queensland Performing Arts Centre] busway station is well known for both its impediments to pedestrian movements, but also for its recent and ongoing pedestrian/vehicular accidents, including pedestrian deaths. The zone has been established to facilitate improved bus movement into and out of the busway tunnel, however, continues to be a real issue to pedestrian and cycle movement between Merivale Street and the Victoria Bridge. (WECA July 2009)

The approach in other areas of Brisbane with new sections of the busway in built up areas has been to tunnel but when coming up to the CBD, close to the river, tunnelling is not an option. Elevated busway corridors may be an option but at considerable cost and with significant visual impacts and with reduced station accessibility.

TCP is a key MASC factor in the urban environment and highlights the relationship between increased transport mobility and decreased accessibility. These impacts can be understood by considering the detail of the transit MASC. This is dealt with in the following sections.

3.4 Bus Rapid Transit Characteristics

In the past two decades there has been a trend towards the formalising of urban bus systems into Bus Rapid Transit (BRT) systems. There are different forms of BRT but most common in Australia is a conventional twelve to fourteen metre bus vehicle with priority

running in highly engineered, highly segregated, dedicated bus transit corridors to accommodate higher frequency, higher speed vehicle movements with minimal stops to maximise travel time and speed efficiency. There tends to be higher quality station infrastructure with lifts and pedestrian overpasses to accommodate station access.

3.4.1 Why Bus Rapid Transit?

Cervero (1998) describes BRT as coming in all shapes and sizes, “but in most places they are characterised by forty-five to fifty-five passenger pneumatic-tire coaches that ply fixed routes on fixed schedules”. Vuchic (2005) notes the BRT approach as an improvement to bus services by upgrading a complex network of low image services into a distinct network with a stronger image and improved impact on land use and city liveability.

Currie (2006) states that BRT provides a rail like quality with lower cost enabling a larger system for the dollar, flexibility, no forced transfers, and short implementation and therefore lower construction, business and community impacts, and notes that bus systems are suitable for low density/small-scale development and higher frequencies provide attractive boarding points for park and ride travellers (Currie 2006, p. 11).

Cervero (1998) finds that, on a per passenger kilometre basis, BRT is generally less efficient in energy use with more pollution than urban rail services (Cervero 1998, p. 17). Dittmar and Ohland (2004) note that BRT’s tendency towards park and ride poses a challenge for urban development due to the extensive parking areas and their poor environmental qualities.

Overall, it can be seen that BRT is a flexible concept with a range of characteristics from simple bus lanes to more sophisticated systems with substantial infrastructure that draw on and structure an existing bus system. It is seen as compatible with car travel, with stations providing park and ride. Just as there are a range of views about what BRT is, there are also a range of views about its costs and benefits and these are explored in the following section.

3.4.2 BRT Costs and Benefits

The Australian BRT experience, considered in relation to other BRT projects, can be seen to occupy the upper end of the cost scale with high quality station and park and ride facilities

along highly engineered corridors providing full right of way access through, under and over the existing urban environment connecting to a CBD/major centre destination.

The Brisbane busway experience, discussed in detail further on in this section, provides a recent example of the types of costs incurred with busway construction. In the case of the Eastern Busway from Buranda Station to University of Queensland Lakes Station, which opened 2009, the 1.5 kilometre section cost AUD\$226 million averaging AUD\$150 million per kilometre. There is a commitment of AUD\$465.8 million for the 2.7 kilometres between Buranda and Coorparoo, averaging AUD\$172 million per kilometre (Queensland Government 2011a).

The significant cost factors include extensive tunnelling, bridge and station structures required to achieve a segregated busway corridor through a constrained urban environment. These are not total system costs and exclude vehicles or depot costs. Associated park and ride facilities at busway stations have been costed at up to \$70,000 per car space at the Klump Road Bus Station (GCCC 2012a).

The Sydney 'T-Way' BRT system connects the western suburbs to Parramatta and was constructed for AUD\$323 million, averaging AUD\$23 million per kilometre. According to Currie (2006a) the stations were poorly located and cost too much to build, but he maintains that dedicated bus roads were a cheaper alternative to new rail lines and would be a cost effective way to service Sydney's sprawl (Bus Australia Website 25 August 2006).

In the United States BRT costs range from US\$200,000 per mile for a street based BRT system to US\$55 million per mile for a dedicated BRT system. BRT was found to have generally lower capital costs but had higher operating costs than LRT in four out of six cities (United States General Accounting Office 2001, p. 5).

The BRT experience locally and internationally indicates a broad range of costs and benefits and high quality BRT systems may be compared to urban LRT costs. The key factor to be considered here is the level of engineering required to provide an appropriate level of segregation to achieve the desired level of transport – time/speed efficiency.

3.4.3 BRT and TOD

In *BRT in Australasia: Performance, Lessons Learned and Futures*, Currie (2006b) reviews four Australian BRT systems: the Adelaide North-East Busway, Brisbane South-East Busway, Brisbane Northern Busway and the Sydney Liverpool/Parramatta Transit-way. Currie finds that there has not been a great deal of land development associated with the Australian BRT. He cites an increase in land values, and some development associated with the Adelaide system at the Tea Tree Plaza Interchange, however these are not deemed significant. A senior planner in Adelaide cited by Currie states, that “there is no evidence of the busway having encouraged additional urban development” (Currie 2006b, p. 11).

An international review of BRT and TOD outcomes is conducted in TCRP Report 90 *Case Studies in Bus Rapid Transit* by Levinson and Zimmerman (2003). The Adelaide, Brisbane, Ottawa, Pittsburgh, and Curitiba systems are examples cited where BRT can have land use benefits similar to rail (Levinson & Zimmerman 2003, p. 8). Report 90 describes the Adelaide O-Bahn at Tea Tree Gully area as an urban TOD, and attributes property prices increase of up to 20 per cent to the Brisbane – South-East Busway, largely due to the busway construction (Levinson & Zimmerman 2003, p. 24).

The stated increase in land values on the Brisbane Busway stations can be considered in the context of property price increases across Brisbane in the early 2000s where Brisbane median house prices increased almost 50 per cent from \$170,000 in 2000 to \$249,000 in 2003 (Abelson & Chung 2004, p. 8).

Bajracharya et al. (2009) refer to the attempt to up-zone around the Holland Park Busway station to reflect the higher accessibility from Brisbane South-East Busway: “This move met with considerable community opposition from a vocal action group opposed to increased density in their neighbourhood as reported in the local newspapers” (2009, p. 5).

There are mixed views on the capacity of BRT to realise land use benefits and TOD. The local evidence shows that the relationship is weak. The claims of significant increases in property values and TOD success highlight the desirability of these outcomes for transit projects but a closer examination of the facts questions the reliability of such claims.

3.4.4 Australian and International BRT Features

BRT has been a popular transit choice for many third world cities, especially in South America, (most notably Bogota and Curitiba) and is increasingly gaining attention in first world cities, including cities in the United States where BRT is proposed as an alternative to capital intensive rail projects (United States General Accounting Office 2001).

The GAO Report finds that BRT normally had a faster operating speed than LRT due to limited stops and longer distances between stations, grade separation, off vehicle fare collection and the degree of exclusive running (United States General Accounting Office 2001, p. 25). The systems were characterised by the addition of extensive park and ride facilities (United States General Accounting Office 2001, p. 5).

Station spacing is important to how the system is accessed. BRT stations in the United States are spaced from 600 metres to 2100 metres; longer distances indicating a stronger emphasis on drive up park and ride rather than walk up patronage indicating TOD (Levinson & Zimmerman 2003, p. 18). Stations require four lanes to allow for overtaking and to support express bus services (Levinson & Zimmerman 2003, pp. 19-20). The ability to accommodate a larger number of vehicles is indicative of higher vehicle frequencies in the system.

The high frequency BRT systems do experience particular problems in the station. Jaiswal et al. (2007), in a study of the Brisbane Busway system, note the problems of peak period loading patterns with buses bunching up so many buses arrive together. Passengers who need to board buses to the back of the queue in the station take longer to board creating further delay and more bunching (Jaiswal et al. 2007, p. 11).

A challenge for 'flexible' BRT systems is the perceived lack of permanence and this is particularly a problem where car rights advocates are successful in having bus lanes converted back to regular traffic lanes. Vuchic argues that the level of permanence depends on the political support for the facilities and cites the threat of pro car/highway groups to the permanence of busways (Vuchic 2005, pp. 10-13). This has been the case in Brisbane, when dedicated bus lanes between the CBD and Fortitude Valley were created in line with the state government's 1997 Integrated Regional Transport Plan but were later removed by the then Mayor of Brisbane, to provide more road space for cars (Krosch 2010, p. 23).

BRT systems may be open or closed. Open systems function like many separate streams converging into one flow, funnelling vehicles into the main bus corridor from outer suburban routes, and operating at increasing frequencies closer to the CBD, hence the need for a higher degree of segregation from the urban environment. This can be found in the Brisbane, Adelaide and Sydney BRT systems. Alternatively, closed systems, like a rail system, only allow certain vehicles to run within the system, these may be distinctively marked, modern, accessible low floor vehicles, running on clean fuel such as compressed natural gas, although diesel dominates, and may have multiple door entry for easier and faster boarding and alighting and shorter dwell times. BRT vehicle design has become increasingly based on modern LRT with futuristic aerodynamic nose fittings and improved interior design (Levinson & Zimmerman 2003, pp. 20 -22).

It is useful to examine more closely the Australian BRT systems in Adelaide, Sydney and Brisbane, to fully understand the MASC and related impacts in the urban environment.

3.4.5 Adelaide O-Bahn

Adelaide is notable in planning circles, laid out in a square mile grid according to the 1839 plan by William Light; the city was included in Ebenezer Howards 'Garden Cities' work (Cervero 1998, p. 363). In 1986 Adelaide was the first Australian city to develop a full BRT system. The Adelaide O-Bahn or the Adelaide North-Eastern Busway (ANEB) was provided as a solution to traffic congestion to the city's north-eastern suburbs and was "perfectly suited to Adelaide's low density, auto oriented landscape" (Cervero 1998, p. 362).

The 12 kilometre system operates on a German designed guided busway which allows conventional buses to enter from outer suburbs running with a simple fixture which enables the guiding of the bus. Buses run in the corridor to the CBD, travelling up to 100 km/h and stopping at only three station/interchanges (see Images 3.1 and 3.2 below).

According to Adelaide Metro (Website 2010), the busway has a theoretical capacity of 18,000 people per hour or one bus carrying 100 people every twelve seconds, although Cervero notes that the actual capacity is 4500 passengers per hour (Cervero 1998, p. 369).

The frequency and speed of buses requires that the corridor be fully segregated from other traffic, hence its location through the lineal River Torrens park corridor originally planned for

the Modbury Freeway. The ANEB corridor runs into the CBD from the north-east of the city. The outer station is Tea Tree Plaza which has developed into a regional shopping centre and hospital precinct. The second and third stations, the Paradise Interchange and Klemzig stations are characterised by low density residential development with substantial park and ride facilities in the station precinct.

The ANEB delivers a strong transport solution in a low density corridor with a focus mainly on park and ride and only limited land development (Currie 2005, p. 7). The success of the system may be the result of the right mode in the right corridor. It is possible that over time the increased accessibility may support infill development following the evolving Tea Tree Plaza development with more stations and new opportunities for bus-TOD.

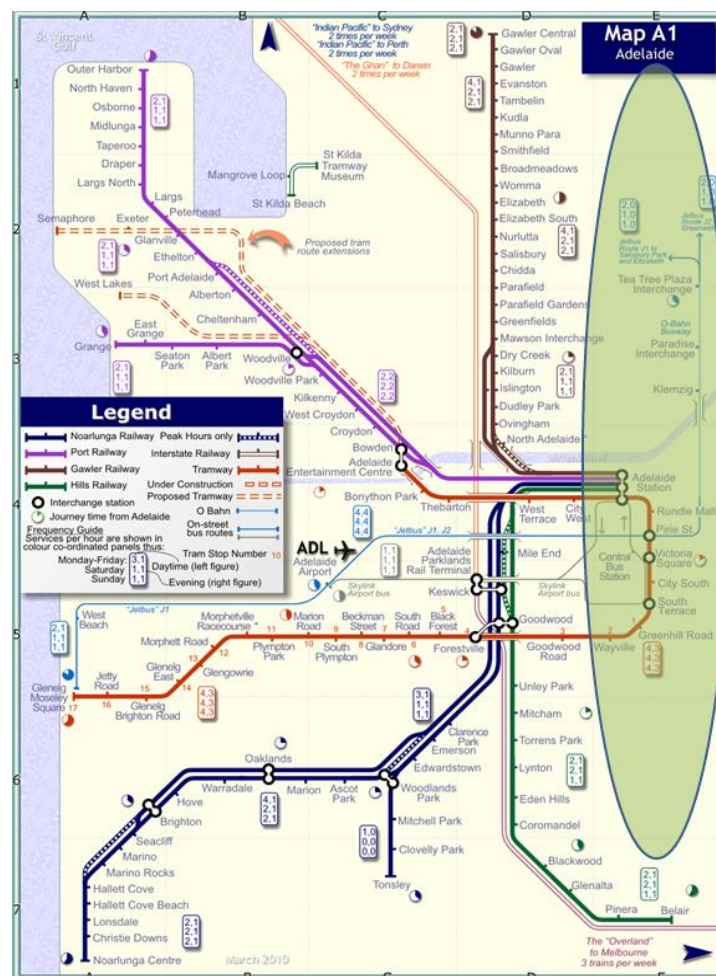


Image 3.1 Adelaide Transit System (O-Bahn corridor highlighted in green on right hand side of map)



Image 3.2 Adelaide O-Bahn Buses on Fixed Track

3.4.6 Sydney BRT

Following the NSW *Action for Transport 2010* strategy (NSW Government 1998) two Bus Transit-Ways (T-Ways) have been constructed (out of seven proposed), one from Parramatta to Liverpool, the other from Parramatta to Rouse Hill. The T-Way is a modest form of BRT by Australian standards with lower construction costs achieved by locating the route and stations mainly out of centre.

Currie (2006a) in his review of the Sydney busway notes a number of challenges for the BRT:

SLPT [Sydney Liverpool to Parramatta Transitway - see Image 3.3] does not have the same quality of right-of-way separation that is exhibited in the other BRT system designs. This is partly explained by the nature of the development environment for each of these systems. SLPT was “built into” or “retro-fitted” into an area with much existing urban development using the alignment and reserve of the Sydney Water Pipeline corridor and also includes much on-street bus lane operation. (Currie 2006a, p. 3)

The T-Way utilises a route and stations on the urban edge with little urban presence or potential for land use development apart from park and ride. However the Parramatta interchange provides a significant destination with strong place qualities in a central location between the rail station and the adjoining Westfield Shopping Centre at Parramatta.



Image 3.3 Parramatta to Liverpool T-Way

3.4.7 Brisbane Busways

The idea of busways, dedicated rights of way for buses in a separate corridor, as a mass transit system for Brisbane reflects the key intent of the SEQ Regional Framework for Growth Management (RFGM), (Queensland Government 1995) and the Integrated Regional Transport Plan (IRTP) (Queensland Government 1997).

The relationship between the SEQ land use and integrated transport policy intent and the busway outcomes is useful to note and can be contrasted with the Gold Coast Rapid Transit (GCRT) case study. Clearly, these are two very different responses to the same policy.

Currie (2006b) cites the Brisbane BRT system as world class but notes that future busway development in Brisbane may be more complicated and expensive on account of fewer freeway and river corridor opportunities. He notes that future busways will need to be retrofitted into the existing urban form at greater expense (Currie 2006b, p. 14). Recently constructed busways in Brisbane, notably the Brisbane Northern, Inner Northern Busways

and the Brisbane Eastern Busway, show significant sections of the system in tunnel and elevated structure.

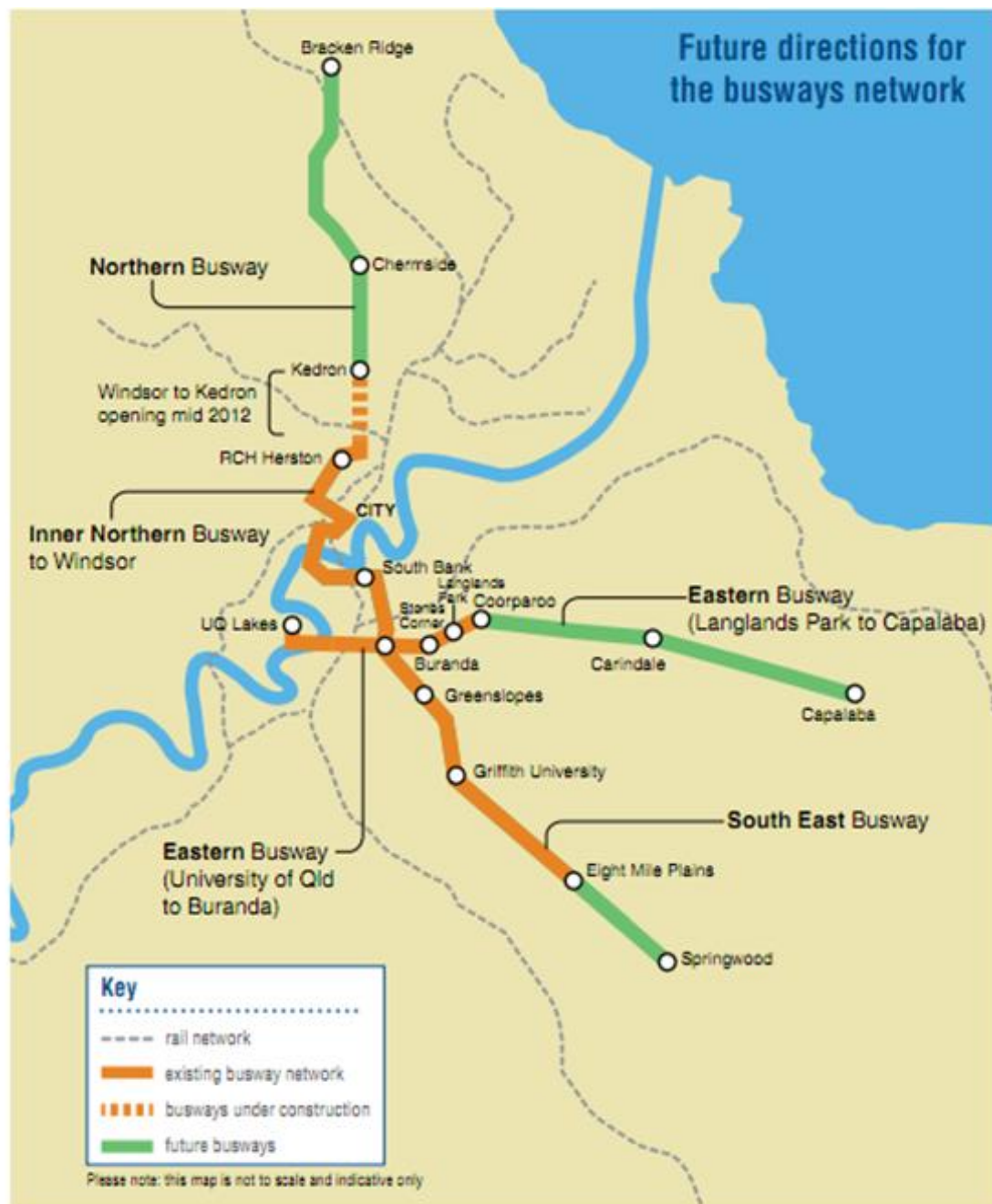
The Brisbane busway strategy draws on similar concepts in North America, notably Ottawa and Pittsburgh. The strategy supported SEQ 2001 which set out the development blueprint for the region's major centres and sought to significantly increase peak hour public transport trips from lower density, car dependent outer areas, to and from the CBD (Queensland Government 1996, p. 10).

The Brisbane rail system was developed in the late nineteenth century mainly for the movement of freight; consequently the rail stations are more likely to serve industrial areas than higher density residential or employment nodes. The busways were proposed to fill these gaps in the rail network (Queensland Government 1996, p. iii).

The IRTP proposal for busways intended to "build on the already strong role of buses in the regional transport system and provide the necessary improvements to system capacity and travel times in a cost effective way" (Queensland Government 1997, p. 39). The IRTP cites a range of factors that contribute to quality public transport but the issue of land use and transport integration is mainly confined to park and ride. Land development at stations is acknowledged in passing "to undertake a demonstration project for a public transport-oriented housing or mixed use development" (Queensland Government 1997, p. 76).

The Brisbane Busway system provides access to a number of major destinations, although this access has required considerable engineering, running under or over grade and spatially isolated from the local context. Many stations are further isolated by significant car parking; note the three hospitals and the Garden City shopping centre, all significant destinations. Image 3.4 below shows the existing and proposed Brisbane busway routes and its relationship to the existing rail network.

The government has sought private sector involvement to develop busway station sites. In 2011, the Department of Transport and Main Roads sought Expressions of Interest to deliver the Coorparoo Junction TOD project with a design competition for the development of the site (Queensland Government 2011a). This busway station location was originally developed as a tram junction and provides a potentially strong TOD outcome.



Source – Translink Network Plan 2011

Image 3.4 Brisbane Busways – Existing, Under Construction and Future Routes

The issue of the Brisbane Busways provides a useful point of difference to the GCRT project. The transit planning outcomes show differing MASC and RASL and land use outcomes. For this reason a more detailed consideration of the Brisbane Busway system is provided here.

3.4.8 South-East Busway

The South-East Busway (SEB) was the first of the Brisbane Busways, becoming operational in 2000, providing access for conventional buses on a 16.5 kilometre route substantially alongside the South-East Freeway, with ten stations between the CBD and the outer suburb of Eight Mile Plains. Major busway station destinations include the CBD, Cultural Centre, Southbank, Mater Hospital, Boggo Road Urban Village, Garden City Shopping Centre and an 800 space park and ride at Eight Mile Plains, and most recently the busway extension south to Springwood to be open in late 2012 (See Image 3.5 below).



Image 3.5 Springwood Bus Station Plan (Source Queensland Transport and Main Roads)

The busway concept was formalised in September 1996 when the Queensland Government established a Public Works Committee to inquire into the feasibility of the SEB project. According to the Queensland Transport submission to the October 1996 Public Works Committee Inquiry into the South-East Transit (SET) Project:

The exclusive right of way that separates buses from general traffic improves the speed, frequency and reliability of services on the busway and reduces operating

costs. Regular stations and ramp access for buses to enter the busway leads to improved and more cost effective services. Frequent stations and ramp access also provides many opportunities to integrate with adjacent developments and employment areas and to physically link the busway to other public transport nodes, notably to the rail network. (Queensland Government 1996, p. i)

The “many opportunities to integrate with adjacent development” noted above may have informed station locations but land use integration was not highlighted in the project Terms of Reference. The SEB Planning Guidelines note that station locations should be selected with regard to integration with other transport networks and with regard to land use planning and redevelopment potential. The Guidelines note that certain stations have the potential to “encourage the development of higher density, transit oriented uses in nearby areas” however, “it is unlikely that redevelopment potential alone would warrant station construction. This criterion is important primarily to the extent that it has potential to generate transit demand” (Queensland Transport 1997, p. 5).

The decision to select the South-East Freeway route instead of the adjacent Logan Road, the original southern tram corridor, is a consequence of a related state government decision to upgrade the capacity of the South-East Freeway and that decision also proposed that the SEB run through South Brisbane with rail interchanges at Southbank and South Brisbane Stations (Queensland Government 1996, p. 13). As a consequence the series of centres along Logan Road are outside the south-east transit corridor. Where the busway does merge back into the urban environment at South Brisbane, adjoining the CBD, the impact of numerous buses in busy periods can be problematic; this is evident in Image 3.6 below.

In relation to pedestrian accessibility to stations, the planning guidelines for the busway show that five of the ten proposed stations are deemed to provide walk up access, but according to these guidelines “no at-grade crossings of the busway for pedestrians will be allowed” (Queensland Transport 1997, p. 8).

The Queensland Government Hansard record highlights a strong focus on the efficient transit features of the busway. A review of ten speeches recorded in Hansard finds commentary concerning issues of cost, patronage, the destinations serviced, travel time savings, and the number of jobs created by the project. The then Transport Minister, Steve Bredhauer, notes “commuters across southern Brisbane have embraced the busway as a

fast, efficient, safe and reliable means of public transport” (Hansard 1 May 2001). Hansard confirms no interest in land use development or TOD potential except for one comment by the then Premier, Peter Beattie, who noted that the busway “will boost urban renewal in the Boggo Road precinct...” (Hansard 26 May 2005). The Boggo Road precinct and the Government owned renewal site, Kelvin Grove Urban Village, have both been developed to take advantage of the busway accessibility.



Image 3.6 South-East Busway at Cultural Centre Bus Station
Source - Bus Australia

According to the Brisbane City Council’s own investigations the SEB is rapidly reaching its capacity under the present operational approach (BCC 2007, p. 41). At one point the SEB has 294 inbound buses in the peak hour. At the Cultural Centre (Image 3.6), where buses mix with other traffic and pedestrians, the volume is 179 buses per hour (BCC 2007, p. 42).

It is in this constrained inner urban environment that the problems with at grade/on street integration are most apparent with high frequency bus movements impeding the safe access of other street users in the Melbourne Street section (WECA 2009).

The images below (Images 3.7 and 3.8) show Brisbane Busway stations and their significant station infrastructure and wide corridor to enable buses to overtake and to accommodate express buses for greater efficiency. The wider station footprint, compared to normal bus

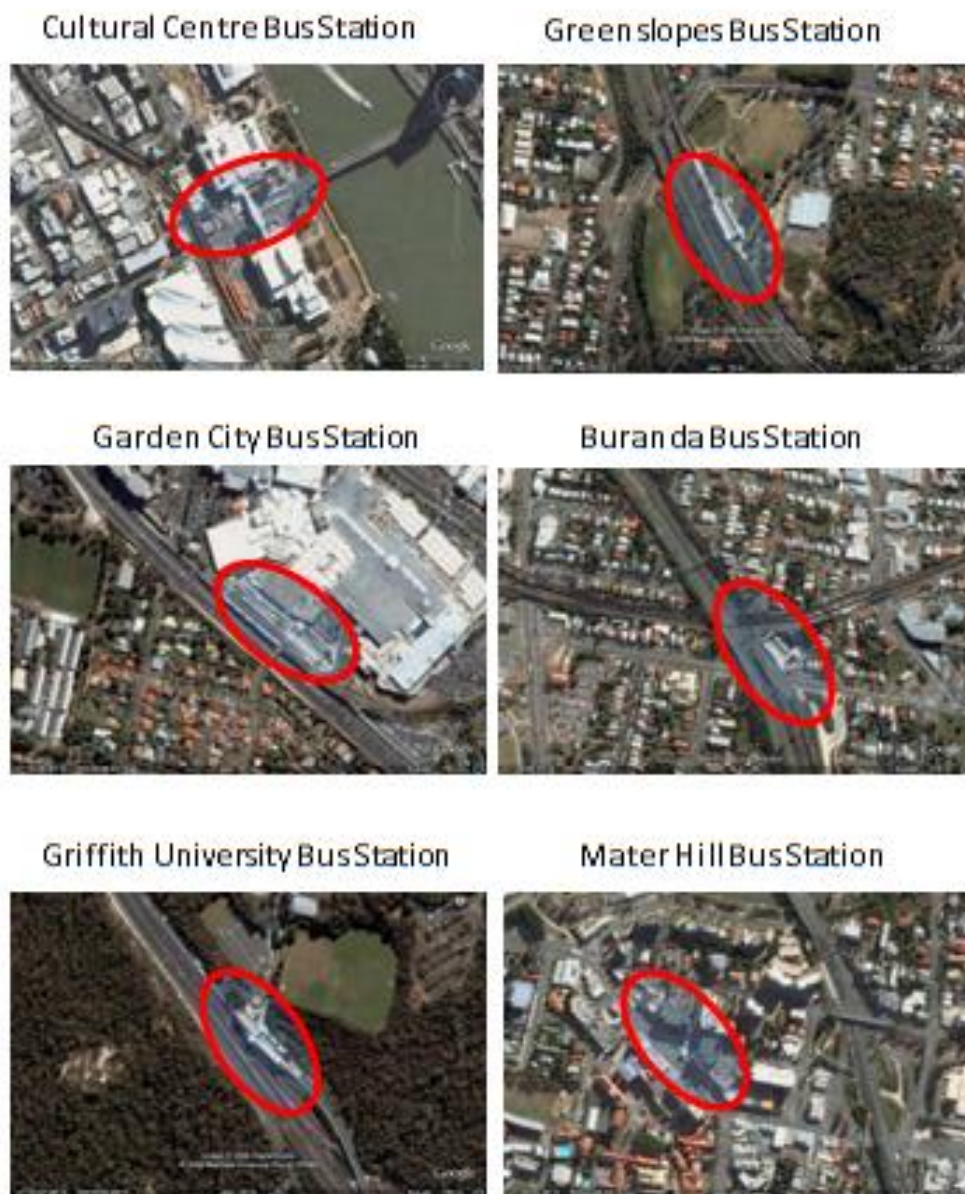
stops or LRT stations makes it difficult to locate stations in centres, hence the tendency for the edge locations or to put busways and stations under or over the road space.

The newer sections of the Brisbane Busway system have limited on street/at grade running. The Eastern and Northern Busways are mainly tunnelled and/or elevated busway systems and pose a very different planning problem to the focus of this research; however these are urban transit systems with stations centrally located in the urban environment so it is useful to briefly review the systems here.



Photos by David Mepham

Image 3.7 Examples of Brisbane South-East Busway Stations



Maps sourced from Google Earth – November 2011

Image 3.8 Examples of Brisbane South-East Busway Station Locations

3.4.9 Eastern Busway

The Eastern Busway is an 18 kilometre busway running from the SEB at Boggo Road, on to the Princess Alexandra Hospital then running east, under and over grade through the old tram alignment on Old Cleveland Road, connecting with Coorparoo Junction and a number of local centres, on to the Westfield Carindale shopping centre and then to Capalaba.

Construction will take place in stages over twenty years. The first section connecting to Princess Alexandra Hospital is complete and projected to carry 7000 passengers in the morning peak by 2016. The current project has \$465.8m funding for 1 kilometre of busway from Buranda to Coorparoo (Queensland Government 2009a, p. 1).

The SEQRP observes Buranda Station as an area under consideration for TOD and notes that Local Area Management Plans can identify other areas suitable for TOD as well as providing incentives, including minimum densities, to facilitate appropriate development of station areas consistent with the SEQRP (Queensland Government 2006b, p. 10:7).

This busway is consistent with other BRT projects where the corridor has limited TOD opportunities, requiring stronger development incentives and guidance from government.

3.4.10 Inner Northern and Northern Busway

The Inner Northern Busway runs from the Brisbane CBD to Queensland University of Technology, Kelvin Grove Campus, to the Royal Brisbane Hospital at Herston. The Northern Busway continues via tunnel to Kedron Brook under Lutwyche Road to the north.

Patronage is expected to be up to 78,500 per day in 2026 compared to the 2006 bus patronage of around 10,000 passengers per day (Queensland Government 2006b).

According to the CDIMP – In Brief document, the specific benefits of the project include:

- Transport, (patronage/time saving) proportion of PT trips versus car trips;
- Social, (connections to work, destination access, PWD access, road safety);
- Economic, ability to stage and better use infrastructure, improved cost recovery for bus services through reduced travel times, lower operating costs per kilometre, higher revenue through patronage growth and reduced bus fleet requirements;
- Environment (sufficiency of bus movement and improved fuel efficiency).

(Queensland Government 2006b, p. 15)

The *Summary of Land Use Impacts* notes that once operational, the Northern Busway would “impact positively on centres through provision of improved public transport access and supporting higher density, mixed–use development” (Queensland Government 2006b, p. 12.7.8). The emphasis in the report on land use change in the station precinct is light, only providing a passing reference to increased densities which are confined to “low-medium” at best and TOD outcomes are not specified.

Image 3.9 below highlights the significant visual impact of the Northern Busway at the Royal Brisbane Hospital before running into tunnel further north. The stations provide a high level of bus efficiency but they tend not to integrate into the urban environment. The size of the station footprint is such that they are more likely to be located outside of the urban centre. The MASC are such that there is a substantial gap between the stated intent of the policy for TOD and the practical realities of high efficiency transit systems.



Source – Skyscraperlife.com

Image 3.9 Northern Busway at Royal Brisbane Hospital

3.4.11 Summary of Brisbane Busways

The Brisbane Busway project has significantly improved the attractiveness and efficiency of bus services in Brisbane with improved infrastructure enabling better travel times. It is evident that there are capacity constraints, notably with the SEB, especially in inner urban pinch points, as buses run into the inner city street network conflicting with other users.

With busways in tunnel or structure there have been better outcomes for the route and station locations, but it is difficult to make an argument that the busways have achieved the level of integration or the TOD outcomes articulated in the SEQ policy. The characteristics of the busway make access and integration difficult but this problem is not acknowledged as a barrier to the TOD objectives of the SEQ policy.

3.4.12 Bus Rapid Transit Characteristics Conclusion

The Bus Rapid Transit examples in Australia tend to be highly efficient transport solutions, especially for low density urban environments. This efficiency is realised through highly segregated corridors which enable high bus frequency and speed. Stations are spaced further apart and suit park and ride. Where BRT runs into dense urban environments they are less pedestrian friendly and less able to integrate into the local street networks.

3.5 Light Rail Transit Characteristics

Light Rail Transit (LRT) has been the mode of choice for many first world cities in the past few decades. Taplin (2011) notes significant new planning and investment in LRT with ninety-three operational light rail systems and seven under construction, plus 343 tram systems, plus eighteen under construction, and 119 light railway systems.

LRT can be found in Sydney, Melbourne and Adelaide with planning underway in other cities and construction of the Gold Coast light rail due to be complete in 2014. This section considers the costs and benefits of the mode and some detail on operational LRT systems in Australia and in the United States.

3.5.1 Why Light Rail Transit?

The term Light Rail Transit is used to distinguish modern urban light rail from older tram and streetcar systems which tend to share the road corridor with other traffic and may have lower speed, capacity and reliability. According to the European Rail Research Advisory Council (ERRAC), light rail is “a tracked, electrically driven local means of transport, which can be developed step by step from a modern tramway to a means of transport running in tunnels or above ground level” (ERRAC Report 2002, p. 6).

There are variations in LRT MASC: they may utilise redundant heavy or freight rail corridors or run on the street in dense urban areas. Some LRT systems run in tunnel or on an elevated structure. At grade urban light rail transit has been strongly associated with TOD and the different types of LRT can be seen to reflect the variations in the capacity to enable TOD.

Vuchic (2007) refers to a number of types of light rail systems reflecting a “virtually continuous stream of innovations...” (Vuchic 2007, p. 534). Types of LRT range from medium performance transit modes such as conventional tramways, upgraded conventional tramways, new tramway systems and LRT networks developed from tramway systems. There are high performance LRT systems such as ‘Light Rail Rapid Transit’ (LRRT) which serve higher speed/high volumes in longer vehicles with significant right of way segregation and Automated Light Rail Transit, a fully automated version of the LRRT, whilst investment costs are higher operational costs are lower with no drivers wages to pay. (Vuchic 2007, p. 534)

LRT has a higher capacity relative to BRT and this is a factor in why and where it might be used. LRT vehicles typically have capacities between 250 and 300 passengers with vehicles up to forty-five metres in length. Overall system capacities depend on the type of running environment and the frequency of vehicle movements. Some cities run larger LRT vehicles in fully segregated corridors, such as in Karlsruhe, Germany, which has a capacity of over 20,000 passengers per hour per direction, and the Advanced Light Rail Transit systems such as the skytrains in Vancouver, Toronto and London’s Docklands which can accommodate more than 25,000 passengers per direction per hour (Cervero 1998, p. 19).

LRT is being implemented in smaller cities with populations as few as 150,000 (Bottoms 2003, p. 713). Cervero (1998) notes the suitability of LRT in cities with populations less than

three million, arguing that a population over this number would justify a metro type solution. He points to the relative affordability of light rail over heavy rail and its ability to adapt to streetscapes in built up environments with minimal disruption. Cervero also notes its ability to be environmentally benign, being quiet, clean and unobtrusive. There are construction benefits with systems able to be built in non-contiguous sections thus eliminating the long lead times associated with heavy rail (Cervero 1998, p. 18).

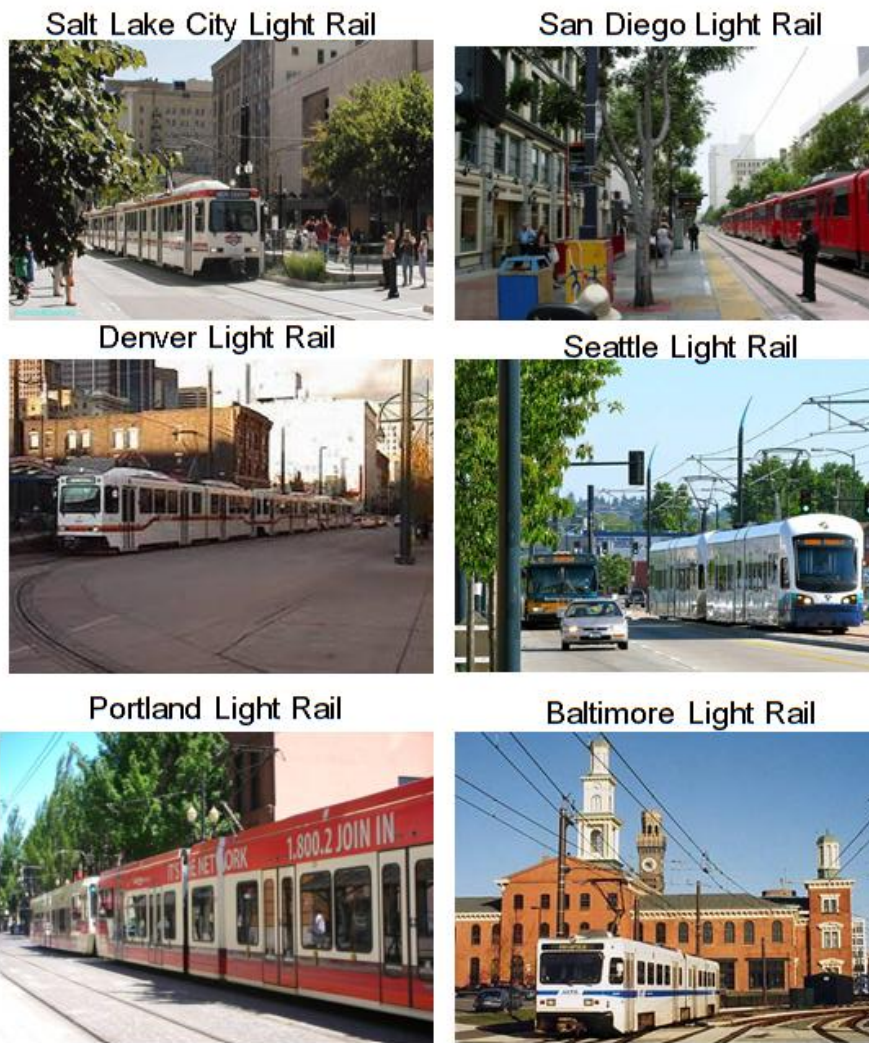
Vuchic (2005) points to the attractiveness of LRT to passengers with its excellent image and strong impact on land use and liveability. He notes that LRT performs differently to BRT and more efficiently in higher density, high capacity corridors, representing a higher investment and higher performance transit system than BRT. LRT benefits include: greater comfort, quietness, reliability, greater vehicle performance, and environmental benefits on account of its cleaner electric running. Vuchic argues that LRT integrates well into pedestrian zones. He also emphasises the permanence of LRT, evident in the tracks, which represent a stimulus for economic and human oriented development (Vuchic 2005, pp. 10-13).

3.5.2 LRT Costs and Benefits

Costs for light rail depend on a number of factors including the route and the level of engineering required. Systems that penetrate into the heart of the centres are likely to incur higher land resumption and construction costs and risks than those to the edge or in existing, redundant heavy rail corridors. It follows that a comparison of one mode/system with another needs to take into account a range of cost/benefit factors.

In the United Kingdom (UK) the Passenger Transport Executive Group (PTEG) report, *What Light Rail can do for Cities* (2005) confirms the capacity of light rail to penetrate into town and city centres with permanent, visible and acceptable infrastructure. They note the importance of the light rail image with its permanency to tangible outcomes such as regeneration and economic benefits (PTEG 2005, p. 46). PTEG find that there is clear evidence that all of the LRT systems in the UK have built up a strong positive image since opening, albeit with some negative perceptions in the construction phase. They conclude that there is also evidence that the improved image has contributed to attracting investment as well as business and tourist visitors (PTEG 2005, p. 67).

The United States General Accounting Office estimate light rail capital costs ranging from US\$12.4 million to US\$118.8 million per mile (United States General Accounting Office 2001, p. 3) reflecting the broad range of LRT possibilities. Amongst the many cost factors are those of land and whether the corridor exists or has to be acquired. Note Image 3.10 showing light rail in the urban environment. The operating costs tend to favour LRT over BRT largely due to fewer LRT vehicles relative to BRT with fewer drivers and less maintenance (Litman 2011).



Photos by David MEPHAM

Image 3.10 Examples of Light Rail in the United States

The interest in light rail investment is varied. It is fixed and therefore permanent. It is seen as a catalyst for new development, renewal and TOD, offsetting some of the cost concerns. It is useful to consider specific examples of light rail. The Australian light rail systems in Adelaide, Sydney and Melbourne and the proposed LRT for Perth are reviewed.

3.5.4 Adelaide – Glenelg Line and Port Road LRT

The heavy passenger line between the Adelaide CBD and the seaside town of Glenelg was converted to a dedicated tram line in 1929. When all other tram lines closed, the Glenelg line - not being an impediment to car traffic - remained open (Brimson 1983, p. 32).

Modern light rail vehicles replaced the heritage vehicles in 2006 and in 2007 the line was extended through the CBD to connect to the Adelaide Station. The 1.1 kilometre extension was laid into the existing road corridor at a cost of AUD\$21 million (Light Rail Now 2007) and has significantly increased patronage and support for extensions (Tourism and Transport Forum 2010, p. 8).

Despite some higher density residential and hotel development and strong retail activity in Glenelg the built form remains substantially low density through the corridor. The Property Council of Australia (South Australian branch) in their study, note that there has been no clear consideration given to possible TOD, although there are opportunities in key sites along the Glenelg light rail corridor including at Glenelg (Property Council Australia 2008).

The success of the Glenelg extension into the CBD has prompted an extension from Adelaide Station to the Adelaide Entertainment Centre, with a plan to extend in the longer term to Port Adelaide via the Port Road corridor as part of the State Government's 'Coast to Coast' vision.

The LRT provides front door access to the Entertainment Centre and an extension of this section is tied to the urban regeneration of Port Adelaide (Tourism and Transport Forum 2010, p. 8). The PCA (South Australia) also notes the opportunity to link light rail through to Port Adelaide and the significant potential for TOD (Property Council Australia 2008).

A relatively small investment in LRT has prompted renewed interest in LRT opportunities in Adelaide and these seem to be as much about the generation of new urban development and the significant opportunity for urban renewal in the Port Adelaide precinct as they are about transport.

3.5.5 Sydney LRT

The urban renewal of the former Darling Harbour port precinct underpinned the decision to create the 7.2 kilometre LRT route which opened in 1997. The LRT was constructed in an old rail freight corridor which originally serviced the Darling Harbour port. Fourteen new stations were created for seven LRT vehicles with an on street connection to Central Station created along an older on street tram route.

The freight corridor alignment, while historically significant, has resulted in a RASL unconnected to activity areas beyond the inner urban - Haymarket and Darling Harbour precincts, and the service is considered to be poorly integrated with the city's bus and rail networks (Light Rail Transit Association 2000).

The historical nature of the area makes renewal and higher density development problematic. Much of the line is above or below grade and segregated from the urban environment. However, in the inner city area the route services the Darling Harbour precinct, Chinatown and the University of Technology precinct before connecting to Central Station.

The new Sydney light rail has prompted interest in a range of extensions including an inner city light rail loop and extensions to outer centres including Parramatta, Bondi and the eastern coastal centres, and the extension of the existing inner western section from Lilyfield to Dulwich Hill (Glazebrook 2009, p. 22).

Extensions to the existing LRT system have been detailed in the *NSW Metropolitan Transport Plan-Connecting the City of Cities*, (NSW 2010) and this confirms the 5.6 kilometre light rail extension, from Lilyfield to Dulwich Hill, at a cost of AUD\$100 to \$120 million. The NSW Government has also undertaken a "detailed transport study to identify the preferred route for light rail through the Sydney CBD" (Sharpe 2010) and a CBD extension connect to Barangaroo and Circular Quay (GHD 2010). In May 2012 the NSW Government announced the awarding of the contract to build the section which is planned to be completed in 2014 (ABC News May 2012). Image 3.11 below indicates the proposed LRT extension into the Sydney-CBD.



Image 3.11 Sydney Light Rail – Proposed Light Rail Extension to CBD

3.5.6 Melbourne - St Kilda LRT

Melbourne is a rare example of a major city that has substantially retained its original tram infrastructure with twenty-nine routes on 250 kilometres of track and 1773 stops serviced by a fleet of 501 trams. Not only has the system survived, it is flourishing with increasing patronage (Tourism and Transport Forum 2010, p, 7).

In recent years the Victorian State Government has invested in the upgrading of the system with accessible low floor 'European style' light rail vehicles and modern light rail 'super stop'

stations, increased traffic priority to improve travel speeds and the 'tram-TRACKER' tools to enable passengers to call or SMS a remote tram tracking system to find out when the next tram will arrive (Victorian DOT 2009). Image 3.12 below shows an example of Melbourne tram/light rail in the street and station.

Melbourne tram on street in CBD



Melbourne CBD - tram at 'SuperStop' station



Image source David Mephram

Image 3.12 Melbourne Trams/Light Rail

An interesting example of light rail can be found on Route 96 to St Kilda which was created out of a disused heavy rail corridor from the CBD which closed in 1987. The original ballast track corridor has been retained although this forms an edge between an established residential area and Albert Park with limited access under or over the track. The light rail extends beyond the original heavy rail terminus at St Kilda onto the active Fitzroy Street and Acland Street precincts. Stations are located at frequent intervals with minimal segregation

enabling easy pedestrian access. The light rail carries 35,000 passengers each day and was voted one of the top ten rail trips in the world (*The Age*, 8 March 2008).

There is potential for further growth in the corridor with urban renewal opportunities in the Melbourne markets precinct and in St Kilda. Newman and Kenworthy (1989 cited in Cervero 1998, p. 328)) note that St Kilda, like other transit serviced inner city suburbs, has densities exceeding forty persons per hectare and public transit carries a third of the work trips. The Melbourne experience highlights the way in which a transit system can define a city and its reputation for liveability.

3.5.7 Perth Light Rail Plan

Perth is a city with low densities and high levels of car dependency. It is estimated that the Perth metropolitan area will experience a 50 per cent increase in population in the next thirty years posing a “phenomenal challenge, but also a tremendous opportunity” to develop a public transit system for the city (Western Australian Government 2007, p. i). In 2007 the Western Australian Government commissioned Maunsell/AECOM to prepare the Perth Light Rail Study (2007) outlining MASC and RASL options for the city. The alignment is shown below in red, in Image 3.13.



Image 3.13 Perth Light Rail Proposed Alignment

While light rail was the preferred mode there were a range of specific light rail technology features to be considered such as floor height and access, capacity, power supply, track type and geometry, and signaling and control systems. The report was particularly concerned with the RASL options and there was an in-depth consideration of land uses, station locations, the key destinations and, at the local level, streetscaping and local economic development (Western Australian Government 2007). The map shows the route from East Perth through to the University of Western Australia via the Perth CBD. There are also spur line options under consideration (Western Australian Government 2007, p. 54).

The report emphasises the opportunities for place making and for urban regeneration. This is evident in the consideration of the Rokeby Road option through the Subiaco area (already associated with TOD) on account of its large patronage but also for its place making potential (Western Australian Government 2007, p. 564). At the time of writing there is no evidence of a financial commitment by the government to proceed with the system.

3.5.8 Brisbane Light Rail Proposals

Following the endorsement of the Wilbur Smith Transport Plan for Brisbane the tram system was finally shut down in the late 1960s. Thirty years later, in the 1990s, there were three light rail proposals for inner Brisbane motivated by urban renewal opportunities, especially in the inner northern area. The first Brisbane LRT concept, released in 1992, proposed a system from Newstead to the CBD. The proposal is considered to have failed on account of the lack of support from the Brisbane Lord Mayor or State Treasury (Turner 2003, p. 749).

In November 1997 the 'BrizTram' light rail proposal was announced, building on the original LRT concept but also connecting though West End to the University of Queensland and to the Royal Brisbane Hospital. This was only one stage of a larger project that was to extend to 'The Gabba' cricket ground and to Lang Park stadium. While this project was considered to be fundamentally sound there was some political reluctance: "the lack of willingness to share jointly in what was a landmark project would emerge as a prime reason for the collective failure of the state government and BCC to champion the project" and with the change of government in 1998 "this all became academic" (Turner 2003, p. 753).

In November 1998 the 'Brisbane Light Rail Project' was proposed by the new government and supported by the Brisbane City Council. This was a similar project to BrizTrams but without the transit bridge across the Brisbane River to the University of Queensland and terminating at South Brisbane. Business support is evident with the Fortitude Valley Business Association strongly supporting the plan, claiming that the project would bring new business to the area (LRTA August 2000). The failure of this project is attributed to a lack of unity at the State and Council level and in this environment a third party, the Property Council, contributed to the perception of unresolved risks in the project and the ultimate withdrawal by the state government of the expression of interest documentation (Turner 2003, p. 757).

There have been no new proposals for light rail since. The story of light rail in Brisbane highlights the considerable risks and the critical need for inter-government cooperation and ownership. The inner urban light rail vision would become overshadowed by a very different transit vision in the form of the busway. The GCRT experience can be contrasted with this.

Australian LRT systems have tended to be segregated into older heavy rail alignments but more recent extensions have been integrated into dense urban environments and CBDs. This has ensured opportunities for urban renewal, local economic activity and a level of pedestrian access appropriate for TOD. This is in line with the European and some of the North American experience, most notably Portland, where at grade urban LRT is integrated into a 'main street' environment.

3.6 Mode and System Characteristics Conclusion

The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* The third sub-question asks: *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?* This section has considered the significance of MASC in relation to transit/land use outcomes, for example park and ride or TOD, showing that as MASC vary, so too do the land use outcomes.

3.7 Route and Station Locations Overview

The route and station location (RASL) options can be seen to be a consequence of MASC factors such as the trip length and station spacing, the vehicle speed and frequency and level of corridor segregation, the station footprint reflecting the number and width of transit lanes and the need for park and ride and related road infrastructure. RASL can also be seen to be an enabling land use factor leading to park and ride or TOD outcomes.

This section reviews the literature in relation to the sub-question: *How is the Route and Station Location shaped by Transit Oriented Development objectives?* This section considers the impact of BRT and LRT on the RASL and considers the land use implications.

The literature highlights how RASL impacts on the capacity to realise TOD outcomes. Calthorpe (1993, p. 104) finds that transit lines are often located where they are not transit supportive, that they do not support density and are more likely to be dominated by park and ride. The evidence from the United States shows that densification does not easily occur in established neighbourhoods and this is often due to local opposition “the simple fact is that cityscapes are firmly entrenched and not easily altered” (Bernick & Cervero 1997 cited in Cervero et al. 2002, p. 14). It follows that transit agencies need to carefully consider where they locate transit station facilities and this is especially so where the transit project is intended to shape growth and to be a catalyst for new development. Cervero et al. (2002) note the challenges of transitioning from park and ride to TOD as the need for significant parking leads to the siting of stations in locations that are not conducive to TOD. These findings highlight the need to ensure that a land development plan is factored into the transit RASL design process to ensure desirable integrated transport and land use outcomes.

Porter (1997) points to the significance of government policies that are required to overcome public and private obstacles to station area development in the United States and to realise TOD. They include the issue of locational liabilities, real estate cycles, non-supportive government policies, cross jurisdictional institutional barriers and auto oriented design, and importantly, a tendency to provide for park and ride rather than TOD (Porter 1997, pp. 11-12). Porter adds that the RASL is rarely determined to maximise development

potential, instead transit lines tend to follow existing rights of way through less attractive locations resulting in station sites that are unattractive to developers and unsuited for TOD:

These locations carry with them all the disadvantages of overlooked and under-desired urban properties... Even in areas that might prove attractive for development, community residents may be the obstacle. (Porter 1997, p. 11)

Even where transit RASL come into areas that are on the verge of development with the “tantalizing opportunities for future development” many communities have found that the development can prove elusive due to the marketplace and that development may even be delayed by the presence of the transit station where land owners are inclined to wait for longer term land value increases (Porter 1997, p. 11).

A transport first approach to transit planning can be seen as a risk for achieving TOD with short term cost/risk outweighing longer term land use and development objectives. The ‘pure’ transport approach is being challenged by New Urbanist and TOD advocates concerned to realise a broader range of liveability objectives beyond time/cost and this view is increasingly evident in the approach to the funding of major transit in the United States where economic development opportunities and environmental benefits are required to be considered in addition to the primary criteria of cost and time saved:

“Our new policy for selecting major transit projects will work to promote liveability rather than hinder it,” said Secretary LaHood. “We want to base our decisions on how much transit helps the environment, how much it improves development opportunities and how it makes our communities better places to live”. (United States FTA, 13 January 2010)

At the national level in Australia it is evident that there is a shift towards an integrated transport policy. The Federal Labor Government has invested in major urban transit projects including the GCRT through the ‘Infrastructure Australia’ program. There is also a policy review process which includes the National Transport Policy. Under the *Smart Transport for a Growing Nation* initiative reforms to transport policy are being developed with a view to a transport policy that responds to population growth, ageing, congestion, accessibility, oil prices and availability, and climate change (Australian Government 2008).

At the Queensland state and SEQ local government level the policy focus has been on achieving transit and land use integration and TOD outcomes with an emphasis on

sustainable development with increased densities and mixed use development in transit corridors and around the station node. The 2005 and 2009 *SEQ Regional Plan* (SEQRP) key objectives refer to integrated transport with a land use policy that details TOD outcomes (Queensland Government 2005, 2009b). However, in spite of numerous new transit projects under design or construction in South East Queensland in the past decade and the significant opportunity to have improved TOD outcomes, neither the policy nor TOD guide considers the transit planning process or the related MASC/RASL outcomes as a factor.

More recently *Connecting SEQ 2031* advances the integrated transit and land use objective through six priorities for action, the first being “Creating compact and connected communities” (Queensland Government 2011d). The policy emphasises the coordination of land use and transport decisions including the early provision of public transport in major new urban communities, the identification of public transport hubs and 'priority transit corridors' where increased residential and commercial development densities should be encouraged, and creating 'fifteen minute walkable neighbourhoods', particularly in major new growth communities to minimise reliance on the car for every trip (Queensland Government 2011d, p. 22). This concept, whilst consistent with TOD outcomes, may be seen as inconsistent with much of the Busway planning where stations outside the inner urban area are not located or designed to be conducive to walk up from the surrounding area.

James (2009) in considering the role of the property sector as an advocate for TOD in SEQ notes a number of obstacles to TOD. His conversations with individual property developers identified the problem of “lower quality of amenity at potential TOD sites around railway and bus stations versus inner areas along river foreshores” (James 2009, p. 195).

The SEQ policy accepts RASL outcomes as presented by transport planners and without questioning the transit planning process or the MASC/RASL outcomes that enable TOD. The Queensland land use and transport planning policy is considered in detail in Section 5.2.

It can be seen that there is a relationship between the RASL and the land use outcomes. The RASL decisions in the transit planning process determine whether that land use is likely to be park and ride or TOD. In recent years there has been a trend towards a stronger policy focus on ensuring that the transit design enables sustainable TOD like outcomes.

3.8 Bus Rapid Transit Characteristics

Bus and to some extent at grade BRT systems can be seen as responding to the urban environment rather than actively shaping it, tending to follow the existing edges provided by rivers, parks or freeways. The result is out of centre RASL with minimal land use activation.

TCRP Report 90 Volume one, *Case Studies in Bus Rapid Transit*, by Levinson and Zimmerman (2003), investigated twenty-six cities: three in Australia, three in Europe, fourteen in North America and six in South America. The case studies show that BRT systems vary significantly in relation to RASL reflecting the range of MASC and how impacts on the urban environment increase in relation to the size of the transit system (Levinson et al. 2003, p. 90).

The Institute for Transportation and Development Policy (ITDP 2007) notes that on-street BRT station locations follow a similar criterion to LRT. Stations on intersections maximise access to cross streets, improve the catchment area and support commercial activities, providing an improved level of surveillance and activity with the convenience of local shopping. Mid-block crossings away from the intersection reduce interference with rapid transit vehicles queuing to pick up and drop off passengers (ITDP 2007, p. 489). The version of BRT discussed here is clearly less segregated running on roads with other traffic.

Wright (2002) in *Bus Rapid Transit, Sustainable Transport: A Sourcebook for Policy-Makers*, notes the importance of the BRT corridor location in relation to its transport objective:

It will impact the usability of the BRT system for the population and have profound impacts on the future development of the city. It is important to identify the relevant corridor for the busways based on appropriate origin destination analysis, which will help identify the daily commuting patterns in both spatial and temporal terms. (Wright 2002, p, 289)

Porter (1997), noting the integration of major bus facilities with rail stations, finds that the association of bus with rail services has undoubtedly helped to stimulate development around rail stations although the precise effects are difficult to measure (Porter 1997, p. 23).

It is evident that BRT tends to adjoin other edges with out of centre stations serving park and ride. Whilst tending not to enable TOD like outcomes, the outer urban sites do provide benefits such as interchange facilities and ample park and ride facilities.

3.9 Light Rail Transit Characteristics

Australian LRT is not generally integrated into the urban environment with RASL mainly to the urban edge, however newer Australian systems such as the Gold Coast light rail and extensions to existing Australian LRT systems are tending towards a higher degree of 'Main Street' running with centrally located stations and a high level of integration into active urban environments related to the interest in using LRT as a catalyst for urban renewal.

Urban LRT systems tend to provide for a closer spacing of stations creating overlapping walk up areas creating linear walkable/transit precincts. TCRP Report 102 notes "a growing number of cities have slated entire corridors for TOD, with rail-served districts stretching over dozens of city blocks"; they include the cities of Los Angeles along their subway line and Houston along the light rail corridor (Cervero 2003, p. 18). The proximity of light rail stations, located more closely together with a stronger emphasis on the walk up patronage, enables a view of TOD not as a single development or place but as part of a system of station places. Cervero (2003) refers to TOD on rail systems as a 'string of pearls'.

3.10 Route and Station Locations Conclusion

The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* The fourth sub-question asks: *How is the RASL shaped by Transit Oriented Development objectives?* This section has considered the significance of RASL as a consequence of MASC but the outcomes are also being shaped by a more proactive transit/land use policy objective. There is a consideration of the way in which both BRT and LRT MASC create differing RASL outcomes.

The RASL decisions are a product of MASC and shape the land use outcomes which are also shaping the RASL options. BRT systems that require segregation tend toward urban edge locations, whilst LRT RASL may run into centres and support urban TOD outcomes.

3.11 Literature Review - Conclusions

A range of literature and ideas, in line with the research questions, has been reviewed in Chapters Two and Three and this is summarised here.

Chapter Two considers the integration of transport and land use and the evolving ideas of New Urbanism and TOD. It highlights the ‘green shoots’ of Development Oriented Transit where the transit planning process is driven by development objectives balanced with mobility. The literature highlights how the transport/transit process actively or passively shapes the urban environment and balances mobility and pedestrian accessibility.

Chapter Three considers the way in which land use is enabled in the transit planning process. It considers the MASC and the RASL with regard to the specific features and with regard to various Australian transit examples where, in spite of the differing features of each city it is apparent that the MASC – RASL – Land Use outcomes are comparable. Table 3.1 below summarises the key findings from the literature review.

Table 3.1 Overview of Chapter Three Literature Review Findings.

LR9 (3.2)	Transit is not neutral in the urban environment. MASC can be seen to impact on RASL options and ultimately impact on the land use outcomes. Light rail is associated with urban TOD and bus/BRT is associated with lower density land use and park and ride.
LR10 (3.3)	Transit Corridor Permeability (TCP) is a MASC factor in the urban environment. High quality and efficient mobility can be achieved but requires corridor segregation and urban edges/barriers which impact negatively on accessibility in station precincts.
LR11 (3.4) (3.8)	Bus Rapid Transit provides an efficient transit solution, especially for low density urban environments. This efficiency is realised through highly segregated corridors to enable high bus frequency and speed. Stations tend to support park and ride. Where BRT runs into dense urban areas they are often barriers to pedestrian access.
LR12 (3.5) (3.9)	Australian LRT systems have tended to be segregated in heavy rail alignments. More recent extensions have been integrated into dense urban environments and ensured opportunities for urban renewal, local economic activity and a level of pedestrian access appropriate for TOD.
LR13 (3.7)	The RASL decisions are a product of MASC and shape the land use outcomes which are also shaping the RASL options. BRT systems that require segregation tend toward urban edge locations, whilst LRT RASL are able to run into centres and support urban TOD outcomes.

The key literature findings in Chapters 2 and 3 have been considered in relation to the key research question and the four sub questions. These are shown below in Table 3.2.

It can be seen that transport planning decisions tend to be made without regard to the urban environment. The modernist - siloed nature of transport planning has led to a focus on higher time/speed efficiencies requiring segregated corridors. These impermeable urban edges are likely to locate transit stations out of centre and unlikely to produce integrated land use and TOD like outcomes.

Table 3.2 Condensed Literature Review Concepts

Main RQ - How do TOD objectives influence the urban transit planning process and outcomes?					
	Sub RQ1 How does transit shape the urban environment and TOD objectives in the corridor?	Sub RQ2 How does the institutional structure and process shape the project and enable integrated transport planning and TOD outcomes?	Sub RQ3 How are Mode and System Characteristics shaped by TOD objectives?	Sub RQ4 How is the Route and Station Location shaped by TOD objectives?	Research conclusions
Existing Knowledge	Transit corridors as impermeable edges and a barrier to ped access and TOD	Tends towards modernist, siloed, specialised, with narrow transport planning focus.	Values transport/mobility speed and time efficiency	Requires segregated right of way. Transit corridor creates barrier to access	TOD: Development is oriented to the transit objective. lower integration and lower yield land use.

Chapter Four, which follows, explains the research method, the rationale for the method and the process of analysis of literature review findings in relation to the new research data.

Chapter 4 - The Research Method

4.1 Background to the Method

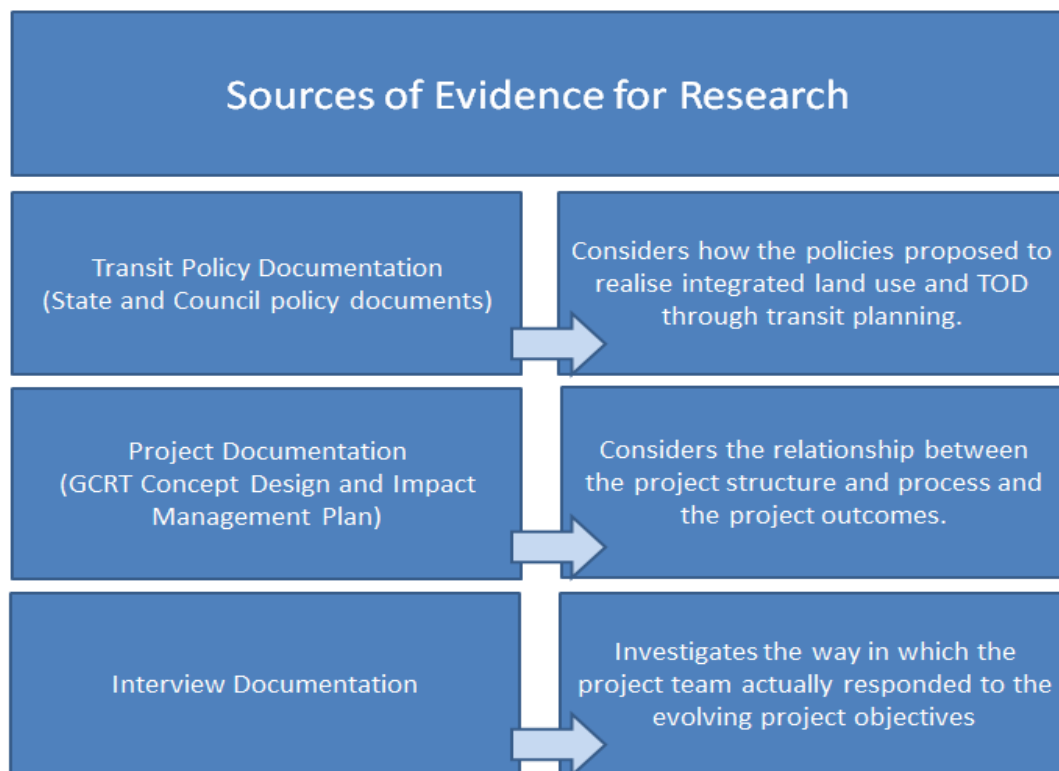
This chapter considers how a qualitative case study approach with a qualitative content analysis is suitable for the research problem dealt with here. The case study deals with questions of 'how' which is the focus of the research problem under investigation here.

The research method has been developed for the purposes of extending the existing theory and knowledge relating to TOD and the transit planning process. The approach explores how key objectives are understood by participants in the planning and design of the transit project and how these objectives shape the urban transit planning process and outcomes.

Three sources of data are used for this research. Firstly, the SEQ regional planning policies from 1995 to 2011 which consider how the integrated transport and land use policies intended to achieve integrated land use and TOD outcomes. Secondly, the light rail project documentation, including consideration of the project structure, process and the project outcomes. Thirdly, through a series of in-depth interviews with those involved in the planning and design of the GCRT project, the research explores how project staff responded to the policy and project objectives.

The in-depth interviews, cross referenced with the documentary evidence, provide a wealth of unique data. To draw out the meaning of the interview data a directed content analysis process is conducted. This approach informs the high level coding categories and in turn informs the process of condensing and abstracting the data into the key meanings.

This qualitative case study provides a social research view of a contemporary transport planning problem. The method can be contrasted with the tendency towards quantitative transport planning research. It seeks to provide an insight into the integrated transport and land use planning relationship which is not well understood but has critical consequences for realising the TOD outcomes. The detail of the method is outlined in Table 4.1 below.

Table 4.1 Overview of Evidence Sources

4.2 The Case Study Method

The primary data for this research is drawn from a single case study of the GCRT project; a \$1.2 billion dollar urban light rail project that runs substantially on street for 13 kilometres through a dense urban environment. The project is expected to be operational by late-2014. The study period is from the first formal statement of the idea of a light rail in late 1998 through to the completion of the concept planning and design phase in March 2009.

The data is drawn from a qualitative case study process. In this respect it approaches the transport planning process from a social perspective rather than the usual focus on the engineering and the quantitative. The particular strength of the case study approach is in addressing the 'how' question. In this case the question is: "How do transit oriented development objectives influence the urban transit planning process and outcomes?"

The research here is interpretative and concerned with exploring how the actors in the transit planning process come to understand and shape the project objectives, noting the higher level institutional and professional influences on the planning and design process and

outcomes. The approach has a distinctly social element to it which puts it firmly outside the conventional quantitative and engineering oriented transport planning research practice.

The use of a qualitative case study method is proposed because of its ability to penetrate into and extract the deeper meanings of day-to-day activities, it is in short a social science tool. Yin (2009) states that the case study is best suited to questions of 'how' and 'why'.

The GCRT project has been selected for study on account of its particular characteristics; that it is a significant urban transit project with a strong focus on land use integration on account of the preferred corridor. This is a unique project by Australian standards. The in-depth qualitative case study was deemed the tool most able to draw out the experience of those involved in the shaping of the project.

The selection of the GCRT as a case study was also motivated by the level of accessibility to key participants by the author. Sufficient access to information is a legitimate factor in the selection of case studies (Yin 2009, p. 26).

To ensure balance in the interviewee experiences a cross section of the planning and design team members is represented to reflect different levels of government and different professional groups. Chapter Six indicates the profession and role of interviewees and the narrative content in relation to the research question is attached in the appendices.

The selection of the case study approach is considered to be the most appropriate to explore the subject in detail however Darke et al. (1998) note that there are situations where the case study method is not appropriate:

... where a phenomenon is well understood and mature, where constructs exist already and are well developed, where understanding of how and why the particular phenomenon occurs is not of interest, and where understanding of the contexts of action and the experiences of individuals in single settings is not relevant. (Darke et al. 1998, p. 280)

There is a growing body of policy and academic research into the possibilities of new transit investment with the related land use integration and TOD outcomes; however, there is little consideration of how TOD is enabled in the transit planning process, the subject of this single case study research.

4.2.1 The Use of the Single Case Study

A qualitative case study approach may draw on the lessons of a number of projects or only one; that is a single case study, which enables an in-depth investigation providing in depth description. This can be contrasted with the multiple case study which enables literal or theoretical replication and cross case comparison. The single case study enables explanations of why and how phenomena occurs which can then be further investigated by applying additional cases in other settings (Darke et al. 1998, p. 281). The availability of suitable case study sites may be restricted and the reporting of case studies can be difficult, therefore: “the rigour of the process used to arrive at the results and the validity of the findings and conclusions reached need to be established” (Darke 1998, p. 274).

Flyvbjerg (2004) has published extensively on matters of transport and on the benefits of the single case study. He notes the differing value between context dependent knowledge/specific knowledge, and context independent/general knowledge. The value of the single case study arises from the specialised nature of the subject matter; it is a choice between breadth and depth. It is the single in-depth case study that provides the in-depth research value (Flyvbjerg 2004).

Flyvbjerg deals with a number of misunderstandings about the single case study approach. The first is that general, theoretical, ‘context-independent’ knowledge is more valuable than concrete, practical, ‘context-dependent’ knowledge. Flyvbjerg argues that context dependent knowledge is at the heart of expert activity, it is the experience with cases that allows one to move from being a beginner to being an expert. In practical terms this means real life experience. Flyvbjerg cites Hans Eysenck (1976) “sometimes we simply have to keep our eyes open and look carefully at individual cases – not in the hope of proving anything, but rather in the hope of learning something!” (Flyvbjerg 2004, p. 422).

Secondly, one cannot generalise on the basis of an individual case; therefore, the case study cannot contribute to scientific development. Flyvbjerg notes the definition of science, “In Germanic languages, the term ‘science’ (Wissenschaft) means literally ‘to gain knowledge’”. He notes the value of the single case study in falsification, where close examination may reveal exceptions to the rule, for example, one black swan falsifies the proposition that all swans are white (Flyvbjerg 2004, p. 424).

Thirdly, the single case study is most useful for generating hypotheses while other methods are more suitable for hypotheses testing and theory-building. Flyvbjerg notes that a case, especially a non-representative case, can provide a unique wealth of information.

Fourthly, the case study potentially contains a bias towards verification, that is, a tendency to confirm the researcher's preconceived notions. Flyvbjerg notes that bias can potentially occur in any method if the researcher is not diligent about their method. On the other hand:

...the case study has its own rigour, different to be sure, but no less strict than the rigour of quantitative methods. The advantage of the case study is that it can 'close in' on real life situations and test views directly in relation to phenomena as they unfold in practice. (Flyvbjerg 2004, p. 428)

In the case study process the researcher will be closer to the subject matter and this may result in a better understanding of the subject. Flyvbjerg notes the potential for falsification in case study research but he also notes that researchers using an in-depth research process may experience challenges to their preconceived views, assumptions, concepts and hypothesis and having to revise their hypothesis; this was the experience in the research process of this PhD where the initial research focus leant towards the deductive, as is the conventional research practice of transport planning, until deeper meanings became apparent in the detailed examination of the interview data.

Finally, it is often difficult to summarise and develop general propositions and theories on the basis of specific case studies. Flyvbjerg argues against the rule of summarising and generalising. He cites Nietzsche (1974) "Above all" he says about doing science, "one should not wish to divest existence of its rich ambiguity" (cited in Flyvbjerg 2004, p. 430).

Flyvbjerg notes that the five misunderstandings indicate that it is "theory, reliability and validity that are at issue; in other words, the very status of the case study as a scientific method" (Flyvbjerg 2004, p. 421). Flyvbjerg goes to some trouble to ensure that the single case study is applied to the right questions in the right way with their respective rules and guidelines to ensure the rigour of the data results (Flyvbjerg 2004).

The Gold Coast light rail, given its location within a dense lineal urban corridor, makes it a unique case study to understand the relationship between land use objectives and the transit planning process. The possibility of providing a second comparable case study, such

the Brisbane busways or the Gold Coast railway, was carefully considered but not pursued on account of a lack of land use focus with these projects, incompatible time frames and access to key participants. It is notable, that several interviewees cited their own experience with these projects and were able to contrast these with the Gold Coast light rail experience.

It was also possible that other light rail projects in the planning phase in other cities be used for comparison, i.e. the Adelaide-Port Road LRT extension and the Sydney CBD light rail extension, but these too were not pursued on account of the fact that they were not able to provide the necessary and comparable level of access and in-depth detail to the GCRT project for a range of reasons including the timing of these projects. These are projects that are likely to continue to expand and in this respect they may provide useful case studies for comparative future research and to test the hypothesis developed in this research.

The single case study has its limitations, not least the ability to provide generalised research findings. The approach does however provide insight into the experiences of those within the project with an understanding of the complex and dynamic relationships between different organisations and professions, and comparison and contrasting of experiences as a team and as individuals.

4.2.2 The Validity of the Single Case Study

Case study research findings may be prone to the criticism that they lack the validity as found in the 'scientific' methods (Flyvbjerg 2004; Kohlbacher 2006). In this research the external validity is primarily achieved by reflecting the views of a representative cross section of those who were central to the GCRT design and planning functions.

The internal validity is primarily achieved through the depth and the detail of narrated experiences where participants are able to provide full and detailed open ended responses. Elliott (2005, p. 23) notes the value of this approach "because participants are empowered to provide more concrete and specific details about the topics discussed and to use their own vocabulary and conceptual framework to describe life experiences". Through the semi-structured interview process research participants were able to reflect at length, in their own time and in their own words, their personal experiences about the knowledge, values, and beliefs developed and observed within the project.

The nature of the single case study process makes it undesirable to generalise the findings but the reader is invited to make a 'common sense' judgment about the way in which the research can be applied to other urban transit projects, particularly the way in which the TOD objective is enabled in the transit planning and design process. The focus is on the lessons of the project rather than trying to prove or disprove a point. Elliott (2005, p. 26) notes the trade-off between depth and breadth in qualitative research, in this case the validity of the research is in its depth with a view to building a better understanding of an integrated and collaborative transit planning process. At the time of writing there has been no similar research undertaken to enable comparison. In this sense the research here provides a unique insight into the urban transit planning process. In the future it will be useful to apply the findings here to other transit projects and to build on this research.

4.2.3 The Reliability of the Single Case Study

The reliability of the research is realised through a representative cross section of interviewees reflecting the range of professional and organisational views within the project. These include engineers, planners, urban designers, community development, politicians, from the private sector and different levels of government, note Chapter 4.5.

The reliability of the research is enhanced by the use of multiple data sources consistent with the principle of triangulation. In this research two sources of data have been selected to cross reference with the interview data; these are formal SEQ policy documents and the GCRT project intent to provide context for the interviews. This will highlight the alignment, or lack thereof, between the formal and informal objectives for land use and TOD.

The reliability may be constrained by the unique nature of the case study project with its dense coastal urban form when many Australian projects run substantially in segregated, low density corridors, often abandoned heavy rail corridors that run outside of the urban centres to the edge of the urban environment. Nonetheless, there is also a trend in Australian cities towards extending transit into dense urban areas, such as in the CBD and in centres such as Haymarket, St Kilda or Glenelg, with many new extensions proposed through dense urban environments. In each case there is potential for future case studies to explore the question of how the TOD objectives have shaped the urban transit planning process and to further develop knowledge and theory about enabling TOD.

The reliability of this approach is enhanced by the recent nature of the GCRT planning and design process, which was still being refined at the time of the interviews. The timing ensured maximum access to key participants and ensured that their experience could be recalled while still fresh in their minds. The particular value of this single case study is in its in-depth investigation and rich description however the research challenge is then how to treat this considerable volume of unique data and to extract valid and reliable meaning from it. This is dealt with in the next section which details the approach of content analysis.

4.3 The Use of Content Analysis.

The interview data is developed into a manageable form, from which conclusions can be drawn, through a process of content analysis. Content analysis is the study of recorded human communications (Babbie 2001, p. 304). This study is achieved through a “set of methods for analysing the symbolic content of any communication” which seeks to reduce the total content of a larger communication “... to a set of categories that represent some characteristic of research interest” (Singleton & Straits 1999, p. 383).

Kohlbacher (2006) argues that qualitative content analysis is especially suitable for case study research and can be viewed as a comprehensive approach to data analysis. He provides a detailed argument in favour of qualitative content analysis as an interpretation and analysis method for developing case studies, and finds that:

In fact, with its rule based logic and methodologically controlled step by step procedures of analysis it manages to combine the advantages of classical quantitative content analysis with a qualitatively oriented approach taking also context and other important points into consideration. Therefore, qualitative content analysis can be viewed as a comprehensive approach to data analysis, which seems to be especially suitable for case study research. It can certainly contribute to adding and enhancing rigor, validity and reliability of case study research. (Kohlbacher 2006, p. 19)

The purpose of the method here is to extend, refine and enrich the knowledge outlined in the theoretical framework which provides the structure within which an inductive method can be applied. Elo and Kyngas (2008) note that qualitative content analysis may be deductive or inductive; the difference depends on the existence of theory or previous knowledge. The deductive method draws on existing theory and the research moves from the general to the specific with a view to theory testing. Alternatively, the inductive

approach is appropriate where there is insufficient or fragmented existing knowledge and the research then moves from the specific to the general (Elo & Kyngas 2008, p. 109).

Whilst qualitative research can be inductive or deductive (Daly 2007 & Mayring 2000 cited in Humble 2009, p. 37; Ali & Birley 1998), Humble (2009) notes that directed content analysis could be described as being deductive and that this might be of concern to qualitative researchers who believe that qualitative research can only be inductive.

There is a tendency to use a combined inductive/deductive approach where an existing theory or prior research about a phenomenon is incomplete and requires further description. Hsieh and Shannon (2005, p. 1286) note different approaches to content analysis depending on the specific research purpose and the state of science in the area of interest.

Hsieh and Shannon (2005, p. 1281) outline the 'directed content analysis' approach which enables the researcher to use content analysis to "validate or extend conceptually a theoretical framework or theory". In this approach the existing theory or research can help to focus the research questions and this in turn informs higher level coding categories which are developed as the researcher immerses themselves in the data to allow themes to emerge from the data (Hsieh & Shannon 2005, p. 1281).

Hsieh and Shannon (2005) contrast the 'directed' method with a 'conventional' content analysis where coding categories are taken directly from the data and without regard to existing theory or research, or a 'summative' content analysis which relies on counting and comparisons of key words (Hsieh & Shannon 2005, pp. 1279 - 1285).

The directed content analysis approach acknowledges and extends the existing knowledge as shown in the theoretical framework, shown in Section 1.8. In this framework the key concepts from the literature and their supporting relationships are articulated and it is this that informs the research questions. It follows that these then shape the structure of the research and the high level coding categories.

4.3.1 Content Analysis and Land Use Planning

Content analysis has been used previously in the study of land use planning policies, albeit mainly for quantitative research. Brody et al. (2006), in their evaluation of sprawl reduction policies in local plans, used a system of coding with five indicators on a selection of planning policies in Florida. They used the planning policies as the unit of analysis and employed two coders to code and score the data. The method provided a quantifiable measurement of the five indicators in each of the policies which was then modified to provide a comparable measure. The results of that study were proposed to be subject to further investigation including a case study analysis of certain jurisdictions to provide a more detailed contextual picture of how and why communities were employing certain planning techniques and the impact of certain factors on the pattern of regional development (Brody et al. 2006, p. 307).

King, in his 2009 PhD study of accessibility and mobility objectives in local and regional plans, uses a system of content analysis to provide quantitative data. He creates a set of indicators designed to measure the strategies and techniques used by planners to increase connectivity. His approach is similar to that of Brody et al. (2006), using a system of coding and scoring of key concepts; a score of zero if no instances in the policy category, a score of one if the policy was mentioned but not defined or elaborated, and a score of two indicating a policy that was discussed at length (King 2009, p. 36).

Berke and Conroy (2000), in their evaluation of plans to examine the concept of sustainable development, start with an initial content analysis to determine how the concept was used in the plans and then go on to develop six operating performance principles which are allocated a zero, one, two score similar to that used by Brody et al. (2006) and King (2009) and go on to develop the analysis through a quantitative method. Their results form “an initial assessment” and they then propose to follow this up with a larger sample of plans (Berke & Conroy 2000, pp. 21-33).

Qualitative content analysis has been applied to the study of land use master planning documentation. Norton’s (2008) evaluation of local master plans and zoning codes in Michigan, USA, highlights variations in the meaning of plans across local jurisdiction types. Norton argues that content analysis is ideal for the analysis of land use plans as they have symbolic meaning and convey messages. His research considers the factors that influence

the content of the plan and then the way in which the plan is used in making development decisions (Norton 2008, p. 432).

Norton notes the challenges of measurement validity and the assessment reliability in ensuring accuracy in the use of content analysis. He states that the measurement validity involves characterising and measuring the issue of concern and this underpins the need to create unambiguous coding categories. The assessment reliability involves the capture of the meaning of a given measure and the reliability of the analysis; its value “depends greatly on the clear formulation of items comprising content categories and on definitions or rules to be used by coders for scoring those items” (Norton 2008, p. 435). The issues of reliability and validity are applied to the coding and content categories discussed later in this section.

The reliability of the content analysis is improved through a clear understanding of how the content analysis was carried out highlighting its strengths and weaknesses, (United States General Accounting Office 1996 cited in Elo & Kyngas, p. 112). To facilitate transferability, the research should provide a clear description of the context, selection and characteristics of participants, data collection and process of analysis (Graneheim & Lundman cited in Elo & Kyngas 2008, p. 112).

In this research the approach to content analysis is structured according to earlier social research. The work of Graneheim and Lundman (2003) is useful here; they have used content analysis in a study of trustworthiness in nursing, detailing key concepts related to qualitative content analysis: unit of analysis, meaning unit, condensing, abstracting, content area, code and theme. Their model has been adapted for the content analysis process in this research and detailed in Chapter 4.4.

A qualitative content analysis approach develops an understanding of the deeper values and meanings in the transport planning process and outcomes and in that respect provides a unique social insight into how integrated transit/land use decisions are actually arrived at.

A valid and reliable approach to content analysis raises challenges for the management and coding of data. Norton (2008) notes challenges with realising measurement validity and assessment reliability. These concerns have shaped the approach to the management and coding of the data discussed in the following sections.

4.4 Management of Interview Data

Seventeen semi-structured interviews were conducted specifically to create data for this research. There are also four other interviews which were conducted separately for the purposes of background data. The high level structure of the interviews reflects the four research questions/concepts drawn from the literature and these are reflected in the theoretical framework. The result is seventeen reasonably focussed in-depth interviews. The interviews are transcribed and each paragraph is allocated a number for later referencing.

The management process for this interview data was developed to support the qualitative content analysis process. There is qualitative data analysis software, such as Nvivo or Atlas.ti, designed to assist in the management of this type of interview data. Having considered the data management options a decision was made to record each of the relevant data segments by theme and sub theme in an Excel program. The program assisted the manual confirming, sorting and matching of key ideas and themes in the data until each segment of data had been best located according to its coding category and sub category.

This approach ensured that the data was treated in a systematic way but with regard to the non-mechanical outcomes, that is to capture the more subtle or intuitive values in the data. The process ensures that the deeper qualities of the interview data are realised.

A content analysis approach requires that certain steps are taken in the management of the interview data. The first is to determine the unit of analysis; these are the three sources of data; the SEQ policy documents from 1995 to 2011 and the two key Gold Coast light rail planning reports. These two sources create context for the third, the seventeen transcribed interviews reflecting the experience of those involved in the planning stage of the project.

The sorting of the data enables the specific relevant interview segments to be extracted from the data and this is the meaning unit. Each meaning unit carries with it its own code for referencing. The content area is that part of the text that addresses a specific topic. The meaning units and content area, having been organised, can then be analysed as a group. This step is described as the condensation of the data which is the process of shortening the data whilst retaining the meaning. The data is shortened again in a process of abstraction of

the condensed data which enables the higher level meanings to come through and clarifies the codes, categories and themes.

Making sense of the meanings in the data requires coding, or a label, applied to categories of text and this is the tool to enable analysis of the data. As discussed the higher level questions have structured the interview data, these are as follows:

1. What was the time frame for participant's activity in the GCRT project?
2. What people and groups promoted the project - professions, values, objectives?
3. How do the particular professional groups perceive their role in the transit/land use integration and TOD planning process?
4. What was the significance of SEQ transport and land use policies at the time?
5. Achieving TOD objectives - how did this develop? What time period?
6. How was TOD enabled? What were the enablers?
7. Discuss MASC and RASL - explain each proposition and discuss.
8. Discuss transit and land use relationship in GCRT.
9. Other comments.

Of the nine questions the last invites the interviewee to add any of the own comments not previously discussed. This provides for the high level organising of data by theme and starts to highlight the underlying meanings and answers the 'how' question. Within each of the themes the sorting of the data and forming of condensed and then abstracted content highlights the fine grained meanings and these are then grouped and labeled. These can then be analysed as groups of ideas and their meaning can be determined and discussed.

Hsieh and Shannon (2005, p. 1285) note that the success of a content analysis depends "greatly on the coding process" and Norton (2008, p. 435) notes that measurement validity and assessment reliability comes out of unambiguous coding categories. Drawing the high level coding categories from the theoretical framework has focussed the process whilst managing the data with a 'hands on' – intuitive approach, and with regard to the context of the interview (Kohlbacher 2006, p. 19) has provided coded data sets that enable meaningful findings and ultimately contribute towards an original academic contribution.

The original interview segments and meanings are provided in Appendix G. The consolidation of the meanings of the data segments are provided in Chapter Six and the consolidated meanings and the abstracted meanings are provided in Chapter Seven.

4.5 Selection of Interviewee Candidates

Seventeen interviewees were selected due to their involvement in the shaping of the GCRT project providing a strong cross section of key participants over several years of the project planning and design. Several other interviewees were invited to participate but were unable to do so for various reasons. The interviews were undertaken between February and June 2011 in Brisbane and the Gold Coast. Each interviewee previously agreed in writing for the interview content to be published in relation to this PhD and to be identifiable. All interviews have been conducted in accordance with the Bond University Research Ethics Committee rules and these are attached in Appendix D.

The interviews were semi-structured based on seven core questions; these questions are attached as Appendix F. The emphasis on questions varied according to the interviewee.

A list interviewees is provided here including professional background and date of interview:

1. Gary Baidon. Former GCCC Mayor. Interviewed Gold Coast, February 2011.
2. Adrian Bitzios. Engineering. Interviewed Gold Coast, February 2011.
3. Adam Boersma. Manidis Roberts Consultants. Gold Coast, March 2011.
4. Steve Brooke. Engineering. Gold Coast, February 2011.
5. Anna Carroll. Project Director. Gold Coast Rapid Transit. Gold Coast, February 2011.
6. Bryan Case. Major Projects. Gold Coast City Council. Gold Coast, February 2011.
7. Michael Chang. Engineering. Gold Coast, February 2011.
8. Ken Deutscher. Transport Planning. Gold Coast, February 2011.
9. Paul Grennan. Manager. Gold Coast Rapid Transit. Gold Coast, February 2011.
10. Rod Grose. GCCC Transport Planning Manager. Gold Coast, February 2011.
11. Marek Kozlowski. GCCC Urban Design Team Leader. Gold Coast, February 2011.
12. Rob Molhoek. Former GCCC Councillor & MP. Southport. Gold Coast, February 2011.
13. Michael Papageorgiou. Planning. Gold Coast, February 2011.
14. Tim Poole. Project Director, Gold Coast Rapid Transit. Gold Coast, February 2011.
15. David Power. Deputy Former GCCC Dep. Mayor /Consultant. Gold Coast, Feb 2011.
16. Warren Rowe. GCCC Director Planning - Transport. Gold Coast, Feb 2011.
17. Leon Seymour Smith. Engineering. Gold Coast, February 2011.

Some of the interviewees have held more than one role in relation to the project between 1998 and 2009. The interviewees include a former mayor and former councillors, current and former council officers, state government officers, project director and consultants to the project. There are civil engineers, land use planners and urban designers. The specific role of participants in the project is dealt with in the course of the interview analysis.

4.6 Method and Data Theory Conclusion

There is considerable research into transport planning but most of this is quantitative, reflecting a paradigm of modernist values and beliefs. This research looks into a poorly understood area of transport planning and highlights an alternative approach to the practice; one that is integrated, collaborative and focussed on enabling land use and TOD, or more specifically a planning process that might be described as 'Development Oriented Transit'. It is within this context that an alternative research approach is proposed.

The case study is a well-established research tool for dealing with questions of 'how' and 'why'. The single case study is an approach that delves into the deeper meaning of the actions of participants in a process and can provide valid, reliable and unique research outcomes that are insightful and relevant to understanding the transit planning process.

A 'directed approach' to qualitative content analysis provides a focussed insight into the relevant area of the transit/land use relationship. The inductive process is focussed onto a specific area of the transit planning process. The method ensures a holistic view of the urban transit planning process and provides valuable knowledge and ideas for future research.

The management of the interview evidence has been done according to a content analysis process which requires that the data is subjected to a process of condensation and abstraction to distil the core meanings from the bulk of the data. This provides a reliable and manageable set of data useful for analysis. The research objectives and method are summarised in Table 4.2 below.

Table 4.2 How the Method Addresses the Research Objectives

Research Objective	Research Method
To understand how the transit planning process contributes to TOD outcomes.	A case study method is appropriate for questions of 'how'.
To extend an area of transport and land use planning knowledge that is not well developed or understood.	A single case study based on policy analysis, documents and in-depth interviews provides insight and depth into the subject area.
To distill the key meanings from the interview data.	A qualitative directed content analysis is conducted to draw out the meanings through a structured condensing process.

Part Two – Beyond TOD Policies to Development Oriented Transit

Chapter 5 – Analysis of the Documentation

5.1 Introduction

The importance of a proactive planning policy to realise TOD outcomes in station precincts has been an area of growing interest in Australia. Curtis (2012a, 2012b) has considered the town planning policy issues in the Australian context and with particular attention to Perth where the Government has promoted TOD over some two decades. With regard to Perth Curtis finds that whilst governments have capacity to implement TOD, the effect on urban development in Perth “has been modest and patchy” (Curtis 2012a, p. 96).

Curtis notes that the building of new railways and station precincts has offered a new opportunity to implement TOD policy but finds that it is evident that town planning schemes are not updated ahead of the railway opening “a case of planners not planning ahead”. The result has been to focus on stations as car based transit interchanges rather than walkable catchments (Curtis 2012a, p. 97).

In this chapter the key SEQ policy and Gold Coast light rail project documents are reviewed and analysed, starting with the SEQ regional land use and transport planning policies from 1995 through to 2011, and then the Gold Coast Light Rail Feasibility Report (2004) and the Concept Design (2009). The first section of this chapter considers the policies which have informed the delivery of the GCRT.

An analysis of these policies highlights the way in which the TOD objective is understood and enabled. The second part of this chapter considers the light rail documentation and this is structured around the research questions with a focus on the institutional structure and processes, the mode and system characteristics (MASC), the route and station location (RASL), and the way in which these factors are shaped by TOD objectives. This analysis also provides context for the interview data in Chapter Five.

5.2 Analysis of South East Queensland Planning Policy

There has been an evolving body of policy relating to regional planning in South East Queensland (SEQ) since 1995 guiding the delivery of integrated transport, transit and land use through to the present. This evolution of SEQ policy can be seen to align with the international trend towards Smart Growth, New Urbanism and TOD, especially from the early to mid-1990s and with the 'renaissance' in urban transit in Europe and in the United States outlined in section 3.5.

The notion of TOD implies integration of policy and practice. In the case of the GCRT there are different levels of government and often different sections of government responsible for the land use and transport elements of TOD. Understanding the way in which the relevant policy integrates requires a consideration of the vertical and the horizontal relationships. The vertical integration occurs between levels of government. Horizontal integration occurs within levels of government between separate departments or branches (Colebatch 1998 cited in Curtis et al. 2010, p. 6).

In his consideration of the SEQ TOD policy James (2009) points to four approaches to TOD in SEQ and these are the Brisbane Urban Renewal project, the Southbank Redevelopment Authority, Queensland Transport for the Varsity Lakes TOD and private sector developers, citing development on the Milton and Albion railway station sites. (James 2009, p. 194). James notes that it is the private sector that is the primary deliverer of TOD but that this in itself will not be sufficient to overcome the obstacles for TOD, which include issues of amenity in less than desirable rail and bus station locations, and that there is a need for larger scale joint public and private partnerships (James 2009, p. 200).

Table 5.1 Time Line of Key Documents for the GCRT Project

Document	Pub. Date	Document Significance
RFGM ²	Nov 1995	Builds on SEQ 2001 with implementation focus, vague assertion of land use/transit integration.
IRTP ³	1998	Focus on transport policy, more focussed assertion of land use/transit integration policies.
Line Haul Feasibility Study	July 1998	High level review of transit mode and Gold Coast corridor options. Does not acknowledge land use/transit integration.
GCCC – City Transport Plan	Sept 1998	Gold Coast City Council's thirty year transport plan acknowledges the need for the Gold Coast light rail and the related land development opportunities.
Shaping Up	1998	Signature project of IRTP – A guide to integration of transport land use and urban design, detailed design guide to realise better active and public transport.
Transport 2007	2001	Local IRTP's, Land use development patterns proposed to support local sustainable transport. Considers location of facilities, densities etc. Flags 'Shaping Up'.
Feasibility Study	2004	Detailed mode and route options with assertion of land use and transit integration and TOD.
SEQRP ⁴	2005	Clear advocacy of TOD in LU objective not carried through to integrated transport policy objective.
SEQRP	2009	Similar to 2005 document but stronger articulation of priority transit corridors and walkable transit precincts.
Connecting SEQ 2031	2011	Details of 2009 SEQRP land use and transit objectives drawn together. Nonetheless, it does not address the way in which transit planning is being delivered.

This section reviews key SEQ regional planning policy documents from 1995 through to 2011. The *Regional Framework for Growth Management* (1995) and the related *Integrated Regional Transport Plan* (1997) represent the beginning of a strategic regional planning policy approach to integrated transport and land use planning for SEQ.

² RFGM – Regional Framework for Growth Management, Queensland Government.

³ IRTP - Integrated Regional Transport Plan, Queensland Government.

⁴ SEQRP - South East Queensland Regional Plan, Queensland Government.

The development of a strategic planning policy framework is a response to rapid population growth in the SEQ region (Queensland Government 1995, p. 2) and the need for better use of infrastructure, especially to achieve better transport outcomes including a significant mode shift from car to active and public transport (Queensland Government 1997b, p. x).

The SEQ policy along with local government policies reflects an evolving understanding about the integration of transit and land use. This theme is tracked through the various policy documents and can be contrasted with the objectives of major SEQ transit investments. There is a particular focus on the SEQ Regional Plans of 2005 and 2009 which effectively bookend the GCRT planning process.

5.2.1 SEQ Regional Framework for Growth Management (1995)

The *SEQ Regional Framework for Growth Management* (RFGM) provides a twenty-five year view of the challenges and the infrastructure needs for the region. It promotes a strategic approach to transport planning and new development. The RFGM is developed around a number of themes including urban growth, residential development and transport. There are also a number of future strategies proposed, including the 1997 Integrated Regional Transport Plan (IRTP), dealing with the transport objective in greater detail.

In theme thirteen, 'Transport', the RFGM objective points to the need to improve efficiency of public transport, to reduce car dependency and increase use of public transport, cycling and walking. It argues for a shift from responding to demand "...to influencing demand by supporting the achievement of the urban growth, residential development, employment location and major centres objectives" (Queensland Government 1995, pp. 59-60). The priority actions include investigation of new urban public transport infrastructure including "options for alternative systems of public transport, such as busways and light rail" (Queensland Government 1995, p. 61). This points to a long-term transit planning vision and can be contrasted with the earlier thinking when the transport solution for Brisbane was the Wilbur Smith Transport Plan and its network of freeways across the city (Krosch 2010).



Image 5.1 SEQ Regional Planning Policy Documents

Theme six of the RFGM deals with urban growth and highlights the need for more efficient land use, with infill and the redevelopment of land, responding to the problems of uncoordinated low density development (Queensland Government 1995, p. 39).

Theme seven, 'Residential Development', refers to increasing residential densities in existing and new areas, "particularly around major centres, railway stations, stops on high capacity transit routes and other transport interchanges" (Queensland Government 1995, p. 43).

Theme eight deals with major centres referring to their need to be serviced by mass public transit, "either on fixed rail or buses operating on dedicated right of ways" and "...fixed rail or high capacity, high frequency buses operating on priority systems" (Queensland Government 1995, p. 46). The priority actions include preparing centre development plans for key centres and these plans should "ensure that the development of the centres is focussed on the public transport interchange, and provides high levels of accessibility,

particularly for pedestrians, cyclists and feeder transport services” (Queensland Government 1995, p. 47).

These policies reflect the need to meet the substantial population growth in the region with a strategic approach to the provision of land use infrastructure. Importantly the RFGM develops the relationship between land use and transport policy.

The RFGM acknowledges the transport/transit and land use relationship but does not develop the analysis or the enabling ideas. At this stage of the policy development the vision for transit oriented development is only partially developed.

5.2.2 Integrated Regional Transport Plan for SEQ (1997)

Developing the transport concepts and actions of the RFGM, the *Integrated Regional Transport Plan for South East Queensland* (IRTP), released in April 1997, is a twenty-five year transport blueprint and considers road, freight, and regional public and active transport.

The policy objective is to increase the proportion of trips made on public transport in SEQ by 50 per cent in the year 2011 so that the overall market share of public transport increases from 7 per cent of all trips in 1992 to 10.5 per cent, compared with a decline to about 6.3 per cent if the trend at the time continued (Queensland Government 1997b, p. 24). For the Gold Coast region the public transport mode share target was proposed to increase from 3.5 per cent in 1992 to 6.5 per cent by 2011 (Queensland Government 2007, p. 156). The policy considers bus/BRT options for Brisbane and, to a lesser extent, the possibility of light rail in for the inner Brisbane area and the Gold Coast.

The IRTP articulates an integrated transit and land use policy beyond public transport integration, i.e. timetables and ticketing. It flags the idea of specialised land uses in the station precinct with higher density mixed use development and emphasises the importance of walkability and cycling. The focus here is on how land use planning outcomes must change to improve the effectiveness of and accessibility to transit.

The IRTP Executive Summary, Objective Six refers to the need for “coordinating transport and land use planning – by supporting more compact, better designed urban development

which supports public transport and allows people to walk and cycle more” (Queensland Government 1997b, p. viii).

Chapter 10, ‘Land Use and Transport’, flags the *Shaping Up* guidelines, (Queensland Government 1997), which deal with urban form and structure to “provide ideas and opportunities for local government and land developers to provide better designed communities which support public transport and non-motorised modes” (Queensland Government 1997, p. 76). There is a focus on urban development that supports walking and to promote neighbourhoods that are able to provide “the lifestyle benefits of reduced car dependency and increased access to local activities” (Queensland Government 1997, p. 76).

Chapter 17 details a list of actions including the planning and development of the Brisbane Busways. The description states that the busways must be located in areas of high demand “where they can be supported by land use patterns which concentrate passenger demands along the route.” The description goes on to state that the busways must also be designed for eventual conversion to a light rail system (Queensland Government 1997, p. 120).

The IRTP signature project, *Shaping Up – Shaping urban communities to support public transport, cycling and walking in Queensland* (1998) proposes guidelines to support better planning and design. It notes the importance of the way in which transport corridor planning and the distribution of land uses impacts significantly on public transport costs, operational efficiency and funding requirements. It finds that public transport is more cost effective and efficient if organised along a linear corridor with highly accessible activity nodes (Queensland Government 1998, p. 12).

The IRTP and *Shaping Up* represent a significant turning point in transport policy for SEQ. The IRTP builds on the early ideas on land use and transit integration flagged in the RFGM and articulates desirable urban design outcomes. This is particularly relevant here as the IRTP also outlines the delivery of significant new transit projects, such as the Brisbane Busway. The question arises as to the extent that IRTP integrated transit and land use policy objectives were a consideration in the planning and design of the Brisbane Busway project.

5.2.3 Gold Coast City Thirty Year Transport Plan

The IRTP is a state government plan intended to inform local government level transport plans (Queensland Government 1997, p. 91). Planning on the Gold Coast, like most other local authorities, had been mainly focussed on building and maintaining roads. There was rail to Southport and Coolangatta from the late 1800's/early 1900's up to the mid-1960s but it is clearly the car that provides mobility and shapes the urban form following the building of the Jubilee Bridge from Southport to Main Beach and the construction of the South Coast Road south to Coolangatta in 1925, and this road, the future Pacific Highway, opened up the coastal edge to new development. The Gold Coast Planning Scheme-Transport Strategy highlights the pervasive impact of the car on the city:

Much of the Gold Coast has developed over the past four decades, during a period dominated by enormous growth of the private motor car as the preferred transport mode in Australia. The existing urban pattern of Gold Coast City has therefore been shaped by widespread access to private cars, and the City and its population are largely dependent upon the car. Communities now extend over much larger areas, which are generally less clearly defined than traditional neighbourhoods. (Gold Coast City Council 2007, p. 24)

The city features significant waterways with canal estates and low density suburbia, designed to be accessible by car. The car is deeply entrenched in the culture of the Gold Coast, evident in the annual Indy or V8 motor race through the streets of Surfers Paradise or the 'meter maids', drive-in motels and the myriad of drive through conveniences along the 'Gold Coast Highway' strip. Robin Boyd's recollections of Surfers Paradise, noted in *The Australian Ugliness* (1960), are evidently experienced through the window of the car:

The strident signs of the motels are rivaled by those of the shops of the "Financiers", "Subdivision Specialists" and the eager drive-in banks...it comes into its own in the warm evening, lit by pulsating neon signs or, where there is nothing to advertise, simply by festoons of globes. At night it could be any American tourist town... (Boyd 1960, p. 87)

Phillip Goad, writing in the *Gold Coast Urban Heritage and Character Study* (1997) notes the significance of the highway along which the dense Gold Coast urban form has evolved:

The highway borders and contains this Miami Manhattan. Contained on either side is the thinnest strip, the strip architecture of archetypically Las Vegas... Contained within it is the drive-by and drive-in architecture of the strip: the motel, the shopping strip, the traffic interchange, the shopping mall, and the landscaped strip of exotic

palms together with strip urbanism: the illuminated signs, convenience stores, petrol stations, traffic lights, and the road itself as the dominant urban space. (Goad cited in GCCC 1997, p. 36)

In 1995, following the amalgamation of two smaller councils to create the Gold Coast City Council, the branches of land use and transport planning were co-located within the Planning Environment and Transport Directorate. The larger council with its greater resource capacity, and the SEQ planning policy in the making, enabled an approach to integrated transport planning beyond its traditional role of building and maintaining local roads to focus on a strategic policy approach supporting the land use objectives of the city.

In July 1997, building on the IRTP, the Gold Coast City Council, in collaboration with the state government, undertook the *Foundation and Feasibility Study for Improved Line Haul Public Transport in the Gold Coast* (FAFS) (Gold Coast City Council 1998b). The study provides the first comprehensive investigation into the future urban transit needs of the city and forms the basis of the 1998 Gold Coast City Transport Plan (CTP).

The FAFS considers line haul transit options for the arterial corridors in the city including the corridor between Southport and Coolangatta with mode options, demand estimates, economic, environmental and social impacts, and a plan for implementation (Gold Coast City Council 1998b, p. 5). The study considers all available mode options but settles on Bus Rapid Transit (BRT) and Light Rail Transit (LRT) as viable options.

The study also evaluates transit corridor options against nine criteria, the first being to link major activity centres along the corridor and secondly, to operate in close proximity to urban centres (Gold Coast City Council 1998b, p. 51). The social and environmental factors include land use impacts but there is no acknowledgement of how transit might act as a catalyst for new development in the corridor; LRT is seen as a negative with its corridor and station impacts on existing property (Gold Coast City Council 1998b, Appendix C).

Based on the key findings of the FAFS, the 1998 CTP was a local transport plan under the IRTP umbrella (Gold Coast City Council 1998a). The Plan makes the case for better transit to meet the growing transport needs of the city and provides a series of strategies to address the problem and proposes a more detailed study of the feasibility and location of major light rail and busway routes. This is dealt with later in the 2004 Light Rail Feasibility Study.

Chapter Five of the City Transport Plan, 'Quality Public Transport', considers new urban line haul corridors for the Gold Coast which were proposed to "act as catalysts in encouraging development of high intensity residential and commercial and recreational uses along the corridor within easy walk of public transport" (Gold Coast City Council 1998a, p. 52).

Chapter Six, 'Co-ordinated Land Use and Transport Systems', considers the issue of a sustainable urban structure, one that reduces the need to travel and to support the operation of public transport and refers to the objective of a system that provides increased opportunities for walking and cycling" (Gold Coast City Council 1998a, p. 71).

Chapter Eight of the CTP, 'Attractive Non Motorised Transport', is focussed on developing an urban environment that is supportive for walking for shorter trips and cycling for longer trips. It notes the significance of walking in relation to accessing public transport. The proposed improvements range from service enhancements and improved information to integration of public transport with land use and urban design "to ensure that major new routes and interchanges are used to define urban structure and to encourage appropriate locations of high intensity land-uses" (Gold Coast City Council 1998a, p. 54).

The CTP advocates strongly for a public transport oriented future for the city. It provides a long term transport vision for transit planning and infrastructure with signature projects including the light rail. It argues for more efficient use of roads and transport infrastructure and for better public transport.

There is recognition of the transport/land use interaction and the potential catalytic impacts of transit enabling future land development in the dense coastal corridor. The significance of the walk and cycle environment is also evident. The policy might be seen as progressive in its time and place. This view is evident in a number of the interviews with council officers and councilors; these are dealt with in Chapter Five.

5.2.4 Transport 2007 – An Action Plan for South East Queensland (2001)

In 2001 the state government published *Transport 2007: An Action Plan for South East Queensland*. The plan provides mid-term actions and a wider range of strategies in response to the continuing increases in the SEQ population and start to show some thinking about the land use opportunities in relation to the Brisbane Busways and the Gold Coast heavy rail although to some extent these are policies reflecting planning that has been completed and the language highlights outcomes that can be considered below the benchmark for TOD.

The commitment to integrated transit and land use is outlined in Section 11 ‘Creating Transport-friendly Communities Through Better Land Use Planning’. The Plan outlines a vision for land use where “residential densities around major centres and most rail stations in the region are substantially increased, enabling significant numbers of people to comfortably walk to frequent public transport services” (Queensland Government 2001, p. 45). The land use achievements cited include “integration of busway stations into major activity centres and urban destinations including Mater Hospital, Woolloongabba, Griffith University and Garden City shopping centre” and refers to achieving “transit supportive outcomes” in relation to the Helensvale rail station precinct (Queensland Government 2001, p. 45).

Section 11, ‘Planning Context’, deals with the relationship between transport and land use and emphasises TOD outcomes referring to increased densities around interchanges and rail stations, improved accessibility and the provision of safe and direct pedestrian cycle routes. The dominance of the transport planning decision over land use policy is a theme; “New transport investments (such as new rail and stations) should be accompanied by complementary land use policies to trigger adjacent transit-supportive development” (Queensland Government 2001, p. 46).

Transport 2007 develops the rhetoric on transit and land use integration but whilst the use of the term ‘integration’ is frequent, the definition is vague and the integration of transit stations into centres is not evident. The policy continues to rely on the subordination of land use planning to transport objectives and in this respect it continues to support traditional transit planning values and outcomes.

5.2.5 South East Queensland Regional Plan (2005 – 2026) and (2009 – 2031)

The *2005-2026 South East Queensland Regional Plan* (SEQRP) responds to the challenge of some one million more people in the SEQ region in the twenty years to 2031 and is significant in that it establishes an ‘urban footprint’ to constrain urban sprawl and support a compact urban form (Queensland Government 2005c, p. 16). The 2005 SEQRP was updated with the 2009 – 2031 SEQRP and these two documents bookend the GCRT concept design process, the 2005 SEQRP initiating the project and the 2009 SEQRP being released soon after the CDIMP is complete.

The analysis here is focussed on two of the twelve regional policies within the SEQRP; Policy 8 ‘Urban Development’ and Policy 12 ‘Integrated Transport’. Within these policies is a ‘Desired Regional Outcome’ (DRO) statement. The 2005 DRO 8 contains nine principles and ten in 2009, with supporting planning policies. The policies are very similar in their form although the 2009 document develops the integrated transport ideas; note the high level policy intent (bolding by author to highlight changes):

2005 DRO 8 Urban Development – A compact **and sustainable** urban **pattern** of well planned communities supported by a network of accessible and convenient centres **close to** residential areas, employment locations **and transport**.

2009 DRO 8 Compact Settlement – A compact urban **structure** of well planned communities, supported by a network of accessible and convenient centres **and transit corridors linking** residential areas to employment locations **establishes the context for achieving a consolidated urban settlement pattern**.

The change in wording highlights the idea of transit corridors and this is developed further in the 2011 *Connecting SEQ 2031* transport planning policy. The 2009 policy emphasises “transit corridors linking” locations but also to shape planning outcomes, creating “a self-contained development pattern [which] reduces the need for travel and provides transport alternatives to the car” (Queensland Government 2009, p. 96). It emphasises “compact” and “mixed use” development and uses the term “transit oriented communities” to describe “mixed uses at key public transport stops, such as rail stations, to create quality lifestyle alternatives for residents”.

The SEQRP 2005 land use objective provides a series of policies in support of TOD outcomes which are developed further in SEQRP 2009 with increased densities and a reference to high

quality public realm that delivers "design that promotes social interaction and inclusion, physical activity and a sense of place and identity" (Queensland Government 2009b, pp. 102-103). It broadens the social objective to include social inclusion and diversity and to promote physical and social connections and a new section dealing with process and the issues of coordination of stakeholders, community engagement and time frames. Table 5 "Transit oriented development precinct typology provides six typologies and guidance notes on appropriate outcomes for each typology. (Queensland Government 2009b, pp. 102-103).

The Integrated Transport DRO, 2005, contains seven policies with six in the 2009 document which marginally increases its focus on land use integration and continues the theme of earlier policy documents where the responsibility for TOD sits with land use policy. The DRO overview shows only a minor difference in the 2009 policy focus:

2005 DRO 12 Integrated Transport: A connected and accessible region based on an integrated transport system that **supports** more compact urban growth and efficient travel; connects people, places, goods and services; and promotes public transport use, walking and cycling.

2009 DRO 12 Integrated Transport: A connected and accessible region based on an integrated transport system that **is planned and managed to support** more compact urban growth and efficient travel; connect people, places, goods and services; and promote public transport use, walking and cycling.

2009 DRO 12 Integrated Transport policies start with 12.1 'Integrated Transport Planning' and refers to the relationship to DRO 8 and the compact settlement objective and states that the ability to achieve this is subject to "a significant shift in the regions transport framework, with a strong emphasis on improving the regions public transport system". DRO 12 includes 12.1.3, "Support transit oriented communities and regional activity centres with priority public transport networks and services and safe cycling and walking routes". It refers to the inter-relationship between land use and transport, and the development of urban areas to support walking, cycling and public transport but the references are not to TOD, as in DRO 8, but to "transit oriented communities" (Queensland Government 2009, p. 140).

Table 5.2 below shows the way in which SEQRP integrated transport planning policies have developed over the course of the 2005 and 2009 policies and the extent to which they show

a transit first, a land use first or a combined approach. All policies in the land use and integrated transport objectives that have an integration theme are counted.

Table 5.2 References to Integrated Transit (IT) and Land Use (LU) in SEQRP

POLICY CATEGORY	2005 LU	2005 IT	2009 LU	2009 IT
Land use and transit are integrated	2	0	1	1
Land use follows transit	5	1	13	1
Transit follows land use	1	2	2	4
<i>Total</i>	8	3	16	6
Total public transport references IT/LU	11		22	

It is evident from Table 5.2 that the issue of integrated transit and land use in 2005 is mainly dealt with in the land use policy with a total of eight references compared to three in the integrated transport policy. In 2009 the number of policies dealing with integrated transit and land use doubled to twenty-two however the emphasis remains substantially with the land use policy. It is notable that the considerable overall increase in 2009 is substantially related to the increase in the land use policies focussed on land use but in a subservient relationship to the transit policy, increasing from five to thirteen policies.

The comparison of SEQ integrated transit and land use policy indicates that the land use objective has increased in significance from 1995, becoming more oriented to integration with public transport policy objectives. However, on the integrated transport side there has been little movement and as recently as the 2005 and 2009 SEQRP the policy approach is to develop transit planning objectives with little regard to integrated land use.

5.2.6 TOD Planning Guide

Following the 2009 SEQRP the Queensland Government has set out detailed guidelines in relation to TOD in *Transit Oriented Development: Guide for Practitioners in Queensland*, (Queensland Government 2010) which states the characteristics for TOD as:

- A rapid and frequent transit service;
- High accessibility to the transit corridor;
- A mix of residential, retail, commercial and community uses;
- High quality public spaces and streets, which are pedestrian and cycle friendly;
- Medium to high density development within 800 metres of the transit station.
- Reduced rates of private car parking. (Queensland Government 2010, p. 2)

The guide goes on to provide twenty-one 'agreed' TOD principles. The principles follow the outline from the SEQ regional planning documents. Of these principles eight may be related to the quality of the station place and pedestrian environment. These are as follows:

1. Land use: type – ensure TOD precincts are dominated by transit supportive land uses;
2. Land use: extent – focus on the area within 5 – 10 minute walk of the transit mode, considering the nature of the topography;
3. Land use: density – incorporate higher density residential uses in TOD precincts to increase vitality and provide more convenient access to services and transport;
4. Land use: mix – provide timely and convenient access to services and facilities required to support people's daily needs, including an appropriate mix of commercial and retail services, jobs, community infrastructure and open space relevant to the surrounding area;
5. Design: built form – ensure development features high quality subtropical design that maximises amenity, street activity and pedestrian connectivity;
6. Design: public realm – provide for a high quality public realm to meet the needs of the surrounding community, including open space, pedestrian areas and transit access, and deliver design that promotes social interaction and inclusion, physical activity and the development of a sense of place and identity;
7. Design: parking – locate, design, provide and manage car parking in TOD precincts to support walking, cycling and public transport accessibility;
8. Transport: mode share – create an increased mode share for walking, cycling and public transport by providing high levels of accessibility and public amenity within precincts to stations and surrounding areas for cyclists and pedestrians, with priority for pedestrians. (Queensland Government 2010, pp. 7-8).

Note the significant emphasis on land use and urban design in relation to the single point regarding transport; in spite of the significant investment, planning and design of major urban transit in SEQ there is no acknowledgement of a role in the process to enable TOD.

A TOD typology is provided, ranging from city centre to the neighbourhood level and reflecting different scales of development. The principles are supported with a range of 'good practice' outcomes and case studies. The guide reflects the challenge of achieving a walkable and place oriented station environment with the busway/BRT response that has dominated the Queensland Government's response to transit planning in SEQ.

5.2.7 Connecting Queensland 2031

Connecting SEQ 2031 was produced in the period after the design of the GCRT however it is useful to briefly review this to see how the TOD and integrated transport and land use objective has evolved.

Connecting Queensland 2031 provides a 'transport blueprint' for SEQ and aims to increase the share of trips taken on public transport from 7 per cent now to 14 per cent in 2031 (Queensland Government 2011d, p. 24). The then Queensland Premier, Anna Bligh, in launching the document, stated that *Connecting SEQ 2031* would provide a "rail revolution in South East Queensland" with the near tripling of rail capacity by 2031, and movement towards a world class public transport system (Bligh Media Statement 31 August 2010).

The document reiterates the message of integration of land use and transit. The then Transport Minister, Rachel Nolan, noted that there was now a greater focus on building housing close to transport services. "I think there is a strong chance of these [new] mode share targets being met, now that transport planning is working much more closely hand in hand with land-use planning" (*Brisbane Times* 31 August 2010, p. ?).

Part A of the document 'Setting the Scene' outlines a strategy for 'Compact and Connected Communities'. It provides for public transport hubs in selected centres with major education and employment, high density frequency services, priority transit corridors, and medium density residential and mixed use development. The philosophy is based on "traditional neighbourhood design concepts, when private vehicle ownership was much lower and so communities were smaller and less car-dependent" (Queensland Government 2011d, p. 30).

Part A also provides for new types of rail services including light rail from Helensvale rail station to Coolangatta and active transport initiatives with an emphasis on new pedestrian and cycle paths and end of trip facilities. Part B of the document 'Six Key Priorities for Action' details the following actions:

- Creating compact and connected communities
- Changing travel behaviour
- Improving transport system efficiency
- Supporting economic vitality
- Protecting environmental quality and health
- Delivering an integrated transport network (Queensland Government 2011d, p. 27)

The policy has a strong focus on walkable communities with TOD principles and densities to support public transport use. It seeks to manage car parking in regional activity centres. It provides for 'Priority Transit Corridors' and proposes '15 Minute Neighbourhoods' as a model for new walkable communities. The policy notes the GCRT project as a catalyst for land use change and proposes to investigate further extensions of the LRT as passenger demand increases (Queensland Government 2011d, p. 46).

Part C of the document on 'Detailed Network Strategies' envisages a 'whole of journey' experience, it encourages people to access public transport by walking/cycling with the inclusion of walk/cycle routes and info on TTA trip planner and end of trip facilities at strategic stations. The section 'Light Rail on the Gold Coast' states that the "light rail will provide high frequency services to transform the coastal corridor from Helensvale to Coolangatta as well as act as a catalyst for land use change" (Queensland Government 2011d, p. 49).

The paper develops the original TOD concept detailed in SEQRP by accepting TOD, rather than 'TOC' and moving towards the idea of integrated systems of TOD in 'priority transit corridors'. It emphasises the importance of pedestrian connectivity and 'fifteen minute neighbourhoods'.

In spite of the improved outcomes there are still notable gaps in the policy in relation to the transit planning process and outcomes and this is evident in the Brisbane Busway system where stations are spaced and located so that they are more amenable to park and ride rather than for TOD outcomes.

5.2.8 Conclusion

It is evident from the data that land use policy in itself cannot deliver TOD. The trend indicates a tendency for TOD policy to transcend bureaucratic siloes, to take a more holistic view of the planning objective; that is to look beyond a simple land use solution. It is also evident that policy is only one of many actions to realise improved planning outcomes.

The SEQ land use and transport policy from 1995 to the present reflects an evolving view of integrated transit and land use objectives aligning with the idea of TOD. These trends can be traced back to a shift in thinking about integrated land use and transport in the United

States from the early 1990s, note Section 2.3, and the discussion about Smart Growth, New Urbanism and TOD, led by the likes of Peter Calthorpe. This is an approach that is underpinned by the challenge of population growth in the SEQ region and the need for improved efficiencies in land use and the provision of transport infrastructure.

In this same period there have been many hundreds of millions of dollars invested in transit projects including a significant Brisbane Busway project and a rail line to the Gold Coast. The projects have not realised significantly increased land uses, densities, and mix of uses or TOD in the corridor. Nor have they met the government's own objective to increase patronage.

It is taken for granted that the business of Queensland Transport is to deliver transport, whilst the TOD objective remains siloed within the land use policy and a separate department. An integrated planning approach is referred to but is not reflected in the institutional structure. The traditional, narrow and siloed approach to transit planning is not addressed by the policy.

In spite of the significant evidence there is no acknowledgement of the way in which MASC differ between the BRT and LRT systems or their differing impacts in the urban environment. Ideas such as priority transit corridors imply TOD outcomes in the transit planning process but these ideas are unaligned with the reality of BRT systems such as the South-East Busway adjoining a freeway with stations spaced for drive up rather than walk up access.

The SEQ policy in relation to land use and transport integration has evolved in its articulation of an idealised integrated outcome from the mid-1990s but in reality it has not achieved an integrated policy solution. In spite of the considerable investment in transit in SEQ in the past decade or so it is difficult to show TOD outcomes consistent with the SEQ policy.

5.3 Analysis of Gold Coast Light Rail Feasibility Reports

5.3.1 Introduction

This section considers the Gold Coast Light Rail Feasibility Study and the Gold Coast Rapid Transit – Concept Design and Impact Management Plan (CDIMP). Responding to the research questions it considers the way in which the integrated land use - TOD enablers, the Mode and System Characteristics (MASC) and the Route and Station Location (RASL) are dealt with.

The light rail project documentation covers a period from 2003 to 2009. In this time the key state government planning policies, the SEQRP 2005 and 2009, were also being drafted so it is relevant to note how the project documentation responds to these policy objectives.

5.3.2 Gold Coast Light Rail Feasibility Study - 2004

In 2002 the Gold Coast Council with the Queensland and federal governments agreed to fund a comprehensive feasibility study into a light rail for the Gold Coast. The four stage report produced by Parsons Brinckerhoff (PB) provided a detailed proposal to “categorically identify the need for line haul transit, conclusively confirm the most appropriate mode and route ...” (Parsons Brinckerhoff 2004, p. 1).

The project was already substantially shaped prior to this study. The PB proposal noted that Gold Coast City Council and the local paper, the *Gold Coast Bulletin*, had been “outspoken” in their desire for light rail (Parsons Brinckerhoff 2004, p. 11) and that GCCC had been investigating light rail in some depth for well over twelve months (Parsons Brinckerhoff 2004, p. 37). The proposal also noted that many of the stakeholders “do not clearly understand the characteristics of modern light rail, bus or modern personal rapid transit” (Parsons Brinckerhoff 2002, p. 11).

The route options had been informed by the findings of the earlier albeit less detailed SKM *Line Haul Feasibility and Foundation Study* (1998). The PB work was also informed by their previous involvement in the SEQ Busway and Brisbane Light Rail projects; the PB Study Project Manager, Damian Bitzios had previously managed the Brisbane Light Rail Project.

The PB Report highlights a number of opportunities for the enabling of TOD outcomes including enhancing city livability and identity, urban renewal and revitalisation, and improved local accessibility. It notes the ability of light rail to act as a catalyst for local area economic improvement, an iconic and expressive element of the 'City Heart' and the Gold Coast itself and an opportunity for integrated, creative and expressive urban art (Parsons Brinkerhoff 2002, p. 14). According to the PB proposal:

... light rail is a potential catalyst for integrated transport planning. Unlike other modes, light rail has the ability to draw in development. Its appearance, its pedestrian friendliness and the presence of tracks all add to the character of light rail systems and in turn to their ability to attract people-oriented forms of urban development. (Parsons Brinkerhoff 2004, p. 36)

The Report notes that indirect benefits of light rail such as tourism and development may be of greater importance in the feasibility than simply considering patronage revenue in isolation (Parsons Brinkerhoff 2002, p. 28). The light rail project is clearly seen as more than just a transport project. The proposal, responding to its brief, details the enabling role of the project in the urban environment. Amongst the thirteen goals outlined and the summary of how they will be achieved are the goals to:

- Determine a vision and supporting components of the Transport Solution - includes land use and transport integration, future transit oriented development/value capture priorities, image building economic development and overall mobility enhancements;
 - Determine the preferred transport mode – objective assessment of mode options identifying a fit within the unique environment and lifestyle of the Gold Coast with image and economic development; and
 - Identifying alignment, including stop locations – these are to be based on locations of the most intense trip activity and balancing this against technical, environmental and financial constraints, all to be developed in consultation with the Gold Coast community.
- (Parsons Brinkerhoff 2004, p. 18)

It is evident in these goals that the vision, the mode and the route and station locations are elements in the way in which the project responds to its urban environment.

The *Gold Coast Light Rail Feasibility Study* consists of four stages; Stage A: Needs and Justification; Stage B: Options Development; Stage C: Options Route and Station Location Assessment; and Stage D: Financial Assessment. Stages A, B and C highlight the issues in relation to MASC and RASL enabling TOD and the content of these reports is reviewed here.

Evaluating the Mode Decision

The Stage A 'Needs and Justification' report evaluates a range of mode options and confirms light rail as the preferred mode for the Gold Coast corridor. Light rail is associated with transport and land use integration, TOD strategies, urban revitalisation, city image building and special events (Queensland Government 2004, p. 3.30). There are also some constraints such as underground service relocations, environmental and amenity impacts, legislative and policy changes, and traffic and transport impacts (Queensland Government 2004, p. 2.1).

The mode choice is based on its specific and measurable ability to meet four objectives: (1) ridership, (2) financial, (3) environmental, and (4) economic. Other desirable objectives are pedestrian compatibility and urban revitalisation which includes "enabling high quality integration with adjacent land use, encouraging transit oriented development and supporting further development opportunities" (Queensland Government 2004, p. 8.2).

The report states that "special attention should be given to the urban design and integration of the system into the Gold Coast urban fabric" and this includes reference to 'Development Oriented Transit' (DOT) where the transit is located in a way that "welcomes and facilitates development" and then to incorporate Transit Oriented Development, ensuring that development in the transit precinct is complementary to the transit (Queensland Government 2004, p. 4.1). The references to DOT highlights a specific approach to the process of transit planning and design, specifically, its location in the urban environment rather than relying on changing land use development to realise better outcomes.

Evaluating Route and Station Location

The RASL for the Southport to Coolangatta section had been previously dealt with in the 1998 SKM report but that report did not consider transit/land use integration or TOD opportunities but it did contemplate a highly accessible route on account of the need to provide access to the retail areas in Surfers Paradise (Gold Coast City Council 1998b, p. 56).

The 2004 PB Report used five objectives to guide RASL options: (1) to be a catalyst for economic development, (2) shape land use densities and types into a more transport-efficient form, (3) minimise environmental impacts and maximise opportunities, (4)

maximise public transport patronage and mobility whilst being extendable, and (5) to be deliverable (Queensland Government 2004, p. 2.1). The evaluation process for RASL followed the same structure and evaluation process to that of the mode, with changes in some of the sub-points and weightings. The emphasis on the land use objective, evident in the body of the report is however a less significant point in the evaluation process.

The outputs from the Stage B report provide a short list of options for evaluation available for the route assessment to be conducted in the Stage C report. In the Stage B report detailed options running from Broadbeach to a future Parkwood heavy rail station were detailed and evaluated with specific benefits and issues highlighted. Key issues in this stage include engineering, traffic and parking, pedestrian accessibility, interchange, and costs.

The route and station location factors considered a wide range of issues however their relationship to the original objectives is not strong. The evaluation process shortlisted the options to remove the most problematic, effectively those running in the most constrained areas. The remaining options were categorised according to their qualities: express, accessibility, coastal, and regeneration.

Station locations are discussed at Section 5.1 of the Stage B report which outlines the factors that should be considered in determining station locations. These are:

- Location of stations so that they are within the key activity nodes and to ensure that future development and activity is oriented towards the station;
 - Spacing of stations to balance station coverage and accessibility with travel time;
 - Higher density areas will have stations located more closely than lower density areas;
 - Lower density areas may require park and ride facilities;
 - Stations should intercept with major traffic and high demand bus corridors;
 - Urban renewal areas or greenfield sites can be activated by stations and planned future stations.
- (Queensland Government 2004, p. 4.12)

The 2004 Feasibility Study positioned the project as a necessary and viable transport project for the Gold Coast. The project was formally announced in the 2006 SEQ Infrastructure Plan and Policy (Queensland Government 2006a) and the detailed Concept Design and Impact Management Plan and related business case commenced shortly after.

In conclusion the PB report is an in-depth feasibility study and provides a useful insight into the urban transit planning process. It is clear from the PB report that the preference for light rail is related to the significant land development, economic development, integration and TOD outcomes that could be realised in the high density coastal corridor, in this respect the project was strongly differentiated from the transit experience in Brisbane and other cities.

The evaluation assessment makes positive statements about desirable economic and land use outcomes and touches on TOD, and even DOT. Whilst there is a high awareness of the value of TOD, at the point of evaluation these benefits are subsumed under other priorities, concerned primarily with the practical engineering issues related to transport planning.

Contrasting the PB report with the earlier light rail feasibility and the SEQ policy development, the transit/land use – TOD rhetoric is much more sophisticated.

The 2004 PB report is significant in that it forms the basis of the Queensland State Government's decision to flag the 'Gold Coast Rapid Transit' project in the 2005 SEQRP with the specific funding allocation in the 2005–2026 *SEQ Infrastructure Plan and Program* for a high quality public transport corridor from Helensvale/Parkwood to Broadbeach to Coolangatta (Queensland Government 2005b, p. 18).

5.3.3 GCRT Concept Design and Impact Management Plan

Following the 2005–2026 *SEQ Infrastructure Plan and Program* announcement, in June 2006 state cabinet approved the development of a *Concept Design and Impact Management Plan* (CDIMP) and business case for two transit mode options for the Gold Coast project: Bus Rapid Transit (BRT) and Light Rail Transit (LRT). The CDIMP was to be undertaken by the state government in partnership with the Gold Coast City Council.

The CDIMP process is required by the Queensland Government as part of its *Value for Money Framework*. The document forms the basis of the project business case to determine the feasibility of the project. The content of the CDIMP is intended to provide a "comprehensive and detailed record of investigations, decisions and outcomes reached during the detailed planning phase" (Queensland Government 2009j, p. 12).

The content of the CDIMP is made up of seven volumes with supplementary reports. The seven volumes of the GCRT CDIMP include the concept design, the urban design, technical documents and twenty-five chapters on impact management. The issues of TOD, planning, urban design, alignment, and mode are found throughout the CDIMP. The CDIMP content is dealt with in this section according to the key research questions.

The CDIMP refers to the SEQRP - TOD objective and to 'Transit Oriented Communities'. The government's TOD criteria are applied systematically to four precincts: Southport, Surfers Paradise, Broadbeach, and Griffith University (Queensland Government 2009f, pp. 13-21). The SEQRP and other relevant policies such as the Gold Coast City Planning Scheme Policy objectives are also considered in relation to the RASL to evaluate the level of compatibility.

Volume Seven, 'Land Use and Planning', reaffirms the SEQRP policy objectives including land use, TOD and integrated transport objectives and states that "GCRT will facilitate the development of TOD by providing high frequency public transport" and notes that key locations along the route have been assessed against the government's key TOD criteria to identify TOD opportunities. The section concludes that the "long term benefits of the GCRT on surrounding land uses will include increased accessibility, improved pedestrian and cycle networks (particularly at GCRT stations), as well as supporting infill and higher density development in key centres" (Queensland Government 2009f, p. 70).

Volume Five, 'Urban Design' was an area where Council's urban design and planning officers had significant input. In this process the preferred RASL's were tested to ensure integration of the system into the dense Gold Coast urban environment. There is a focus here on the way in which the transit system enables land use change and TOD.

On the whole the GCRT CDIMP has a strong focus on the impact of the project on the urban environment, land use planning and urban design but there is little in the way of a bigger vision for the corridor or the sense of urban transformation that is evident in the project team, note the interview content in Chapter Six.

5.3.4 Evaluating the institutional structure and processes

The governance of the project was conducted via a steering committee, later the Project Executive Group, consisting of senior officers from the Translink Transit Authority (TTA) on

behalf of the State Government, Gold Coast City Council, Queensland Treasury, and later, following Federal Government funding in 2009, the Federal Department of Infrastructure, Transport, Regional Development and Local Government. The steering committee was to consider the key issues and to make recommendations to the Minister for Transport (Queensland Government 2009j, p. 16).

The original MOU between Council and the State stated that Council would provide offices for the project ensuring that it would be run out of Gold Coast City and ensured that staff from the Gold Coast had access to the project on a day-to-day basis. Council was also involved in the day-to-day operations through the embedding of Council planners in the project. They reported back to Council through the GCRT Reference Group involving a range of Council officers with input into the range of planning decisions. Council officers were also directly engaged to provide advice through a number of specific CDIMP workshops.

The GCRT 'Lessons Learnt' report (2012), notes the unique nature of the project with its three levels of governance, and finds that "there was a strong influence within the governance framework on providing the required involvement, engagement and transparency to enable timely and effective decision making to drive positive project outcomes." (Queensland Government 2012). GCRT passed from TTA to the Portfolio Investment Division of the newly amalgamated Department of Transport and Main Roads (DTMR) in 2009, then to the Major Infrastructure Projects division of DTMR. As the project evolves into a PPP then the structure changes again (Queensland Government 2012).

5.3.5 Evaluating the Mode Decision

The CDIMP was required to evaluate both BRT and LRT options. This evaluation of two mode options had not been undertaken previously for a project in SEQ. The BRT/LRT vehicles were to operate in a closed transit system with a dedicated two way two lane corridor and stations and were required to meet the same system patronage capacities.

Volume Seven Technical Report 'Bus Rapid Transit Operations Assessment' details the specifications and states that BRT:

...offers a much higher quality service than an ordinary bus, with specially designed buses running very frequent services and higher reliability and faster travel times than buses operating in mixed traffic. (Queensland Government 2009h, p.: 6)

The BRT system considered 18 metre single articulated and 25 metre double articulated vehicles with total carrying capacities of 125 and 175 passengers respectively. The buses would be required to meet passenger capacity targets and would ultimately need to run in a double header arrangement; that is end to end (Queensland Government (2009h, pp. 14-15).

The vehicle capacity is a critical issue with smaller, standard buses requiring more vehicle movements in the corridor to meet the same patronage capacity. This raises problems with on street vehicle spacing and headways which had to be at a minimum of three minutes to fit with intersection phasing. To meet the 2041 peak period target of 7000 passengers in the peak hour, the BRT would have to carry four passengers per square metre (The recommended capacity is three passengers per square metre but four is used for maximum capacity) on a 25 metre double headed (one vehicle following another) bi-articulated vehicle. Whilst this is technically possible there are greater operational risks compared to a single vehicle with the same total carrying capacity (Queensland Government 2009h).

Multiple buses also raised the need to provide for overtaking to 'leap frog' to avoid vehicle bunching and to enable express services. Overtaking lanes are most desirable at the station, but this was not recommended due to the significant increase in land acquisition impacts. If this was to occur then there would be major differences between the physical requirements and the operational characteristics of the BRT project and the LRT project. Consideration was given to providing one overtaking lane for both directions, as in some South American BRT systems, but this was undesirable due to operational and safety issues. Passing opportunities could be limited to certain stations and based on operational and space issues. This was recommended for the three regional stations "where it was viable and feasible to do so" (Queensland Government 2009h, p. 63).

Volume Seven Technical Report 'Light Rail Transit Operations Assessment' provides two LRT vehicle options for the GCRT, 35 and 45 metre vehicles with total capacities, at four passengers per square metre, of 249 and 324 respectively. At three minute frequencies the

2041 peak hour capacity is 6480 (Queensland Government 2009i, p. 26) which is less than the BRT capacity but is achieved with less risk, without the need for overtaking lanes in stations and with a compact two lane station footprint.

Considering the two mode options, as detailed in the CDIMP, there are notable differences between the modes detailed in the GCRT proposal. The GCRT is proposed to be a closed system with limited vehicle movements at controlled time intervals so there is less vehicular traffic and less corridor segregation.

The station footprint may be significantly larger for the BRT option where overtaking lanes are provided to maintain system efficiency. The station footprint has urban design consequences with impacts on the station location, especially the major station locations; consider the impact in a dense urban environment of an additional eight metres, i.e. two road lanes.

There are then issues in relation to access and the capacity to cross the corridor at grade or, with a wider station footprint, or the need to provide a pedestrian overpass impacting on the permeability of the system in the urban environment. Note the permeable nature of the Surfers Paradise GCRT station in Image 5.2 and impression of light rail vehicle in Image 5.3 below.



***Image 5.2 Impression of Light Rail Station at Surfers Paradise
(Source: GoldLinQ)***



Image 5.3 Impression of GCRT Vehicle (Source: GoldLinQ)

Following the detailed evaluation of the design issues and associated costs the State announced its preference for light rail. The evaluation found that both modes could satisfy the required passenger demand and BRT was able to provide many of the potential transport benefits of LRT at a lower initial cost, however LRT was considered to have greater potential to encourage economic development and mix with pedestrians in centres (Queensland Government 2009j, p. 9). *Connecting SEQ 2031* (2011) acknowledged the transformational benefits “Light rail will provide high-frequency services to transform the busy coastal movement corridor on the Gold Coast” (Queensland Government 2011d, p. 5).

5.3.6 Evaluating Route and Station Locations

The 2004 Feasibility Study and the CDIMP, considered numerous RASL options in the coastal corridor. Volume Two, Chapter Two, ‘Alignment Selection’, reviews the alignment options that were considered through a range of studies. The factors considered in the CDIMP route options evaluation are:

1. Maximisation of system patronage - considers ease of access to destinations with a strong walking catchment with minimal barriers to station access;
2. Cost effectiveness - considers the availability of an appropriate corridor and issues of width, services etc. which impact on system capital and operating costs;
3. Minimising land acquisition - much of the land in the corridor comes at a high cost;
4. Minimise the creation of new corridors. The preference was to operate the GCRT within the existing road corridor. (Queensland Government 2009k, p. 3)

The contentious RASL were in Surfers Paradise and Southport with desirable corridors running in dense urban environments. The route options through the Southport CBD were “strongly influenced by current and future land use” (Queensland Government 2009k, p. 17), note Image 5.4 below. The consultation process around the project was contentious with a campaign by the Southport Chamber of Commerce against light rail and the route option through the ‘Main Street’ of Southport, Scarborough Street.

The RASL issue in Southport focussed on two route options (S1 and S2) and was finally resolved narrowly in favour of the Scarborough Street option (see these two options shown in Image 5.5 below), shown in red, over option along Marine Parade/Gold Coast Highway.

The argument in favour of the Marine Parade option, note the yellow dotted line, on Image 5.4 below, was premised on its transport benefits with space for an interchange and park and ride. The matter was ultimately decided on the better access and land use benefits of the Scarborough Street, the ‘Main Street’ option. The Southport Master Plan notes the potential catalytic impact of the light rail in Southport (Gold Coast City Council 2009c, p. 13) however this also had the most significant impact on local traders and property owners.

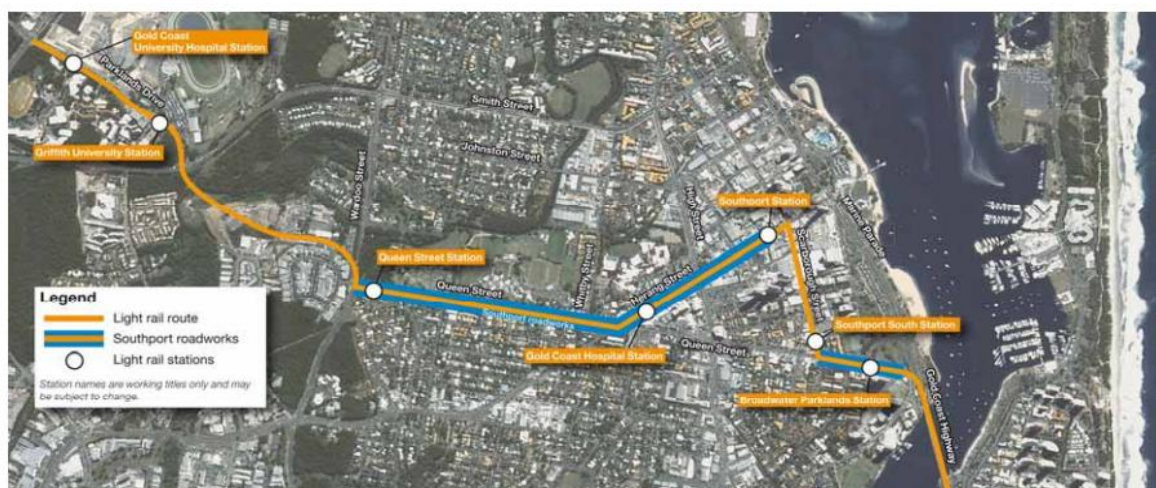


Image 5.4 Final Route through Southport (Source Queensland Transport 2009k)

The route in Surfers Paradise was highly constrained and affected by the strong community desire to minimise property and traffic impacts. The option to run in Surfers Paradise Boulevard with one lane of southbound car traffic was selected. This was considered best for

traffic and event impacts, best for pedestrian accessibility and best for retail and tourism (Queensland Government 2009g, p. 24). The CDIMP does not attribute any TOD or land benefits with this option except that it minimised impacts and property resumptions.



Image 5.5 Route and Station Locations Southport CBD (Queensland Transport 2009k)

A late change to the Surfers Paradise route was made in 2010, after the CDIMP had been completed. The route change followed a decision to end the Gold Coast Indy motor race and the shortening of the track consistent with a National V8 event. This enabled the GCRT route

to be rerouted into northern Surfers Paradise Boulevard with the opportunity for significant urban renewal, note new RASL, second and third stations from left in Image 5.6 below.



Image 5.6 Surfers Paradise/Broadbeach Route (Source Queensland Transport 2009k)

The detailed route design and station concepts are developed in Volume Five, 'Urban Design', which outlines the key themes for the project including TOD and Place Making objectives. This volume is linked to the 'Urban Design, Landscape and Visual Environment' chapter in Volume Two 'Impact Assessment' which was "created as an integrated Concept Design, incorporating engineering, transport planning and environment disciplines" and details the methodology for the design process (Queensland Government 2009k, p. 2).

5.3.7 Conclusion

The light rail project was outlined in Council's 1998 City Transport Plan. The concept was developed in the 2004 Feasibility Study which shaped the vision for a light rail corridor to connect the string of beachside centres. Importantly, this idea evolved to tie light rail to the objective of renewal and city building in the corridor. The 2004 Feasibility Study provided the Queensland Government with the confidence to confirm and fund the CDIMP.

Key themes in this documentation might be seen to lead rather than follow the State policy, especially in relation to the articulation of the urban transit/land use opportunities following the developing ideas of Smart Growth, New Urbanism and TOD in the United States..

The CDIMP documentation provides an insight into the formal structure and process of the project and way in which transport, land use and TOD objectives were to be realised. It

provides a particular focus on the issue of MASC, having to evaluate both BRT and LRT options, as well as a detailed consideration of the RASL options.

In spite of the significant amount of documentation dealing with the TOD enabling issues within the transit planning process the approach to land use is either silent or neutral.

5.4 Policy and Project Document Conclusion

Whilst the SEQ planning policy development has evolved to recognise the wider integrated land use and transit/transport and TOD objectives from 1995 to the present, it is hard to argue that these policy objectives were realised in the Brisbane Busways which have been planned and constructed in this time. Alternatively, the planning and design for the GCRT since the late 1990s has reflected the evolving SEQ planning objectives with stations located to support existing and potential development consistent with TOD.

The primary research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* The question is addressed through four sub questions. The second question deals with the issue of institutional structure and process and asks: *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?*

The SEQ policy does not acknowledge planning structures or processes as enablers for the policy outcomes. Council had made a financial contribution to the GCRT and the CDIMP emphasises the partnership between the State and Council and acknowledges the respective transport and land use planning policy objectives. The partnership is reflected in the governance of the project which includes Gold Coast City Council representation on the project steering committee alongside senior officers from Translink, Queensland Treasury and the Department of Infrastructure and Planning.

The third sub question asks: *How are the Mode and System Characteristics [MASC] shaped by Transit Oriented Development objectives?* The SEQ policy is neutral on the MASC impacts on land use and enabling of TOD. The CDIMP project documentation shows that BRT and LRT were evaluated for the GCRT assuming that both modes were able to operate efficiently in a similar system however this does not acknowledge the MASC differences and their impact in

the transit corridor and the station environment. The investigation found that whilst both modes could satisfy the required passenger demand and BRT was cheaper, LRT was considered to have less risk in meeting operational requirements with greater potential to encourage economic development and mix with pedestrians in centres.

The fourth sub question asks: *How is the Route and Station Location shaped by Transit Oriented Development objectives?* The SEQ policy is silent on how RASL shapes or are shaped by TOD objectives. The recent policy ideas related to TOD and land use integration, such as priority transit corridors, imply TOD outcomes in the transit planning process but these do not align with the reality of at grade BRT systems such as the Brisbane South-East Busway, where the route adjoins a freeway and stations are spaced to satisfy transport objectives such as drive up and convenient parking rather than a station location and land use outcomes that support walk up access.

A number of specific factors are formally considered in the evaluation of the GCRT - RASL options and these are the maximisation of system patronage, cost effectiveness, minimising the creation of new corridors and to minimise land acquisition, which was initially the extent of the land impact issue within GCRT, before the city building objectives were enabled in the planning process. It is evident that as the GCRT planning process developed the RASL is increasingly influenced by the opportunity to support existing and potential development consistent with TOD, notably in the Southport CBD and in Surfers Paradise.

Finally, it is notable that the CDIMP, whilst generally reflecting the SEQ policies, has a commitment to land use and TOD outcomes beyond the SEQ Regional Plan. This highlights the unique nature of the GCRT – light rail and the land use opportunities that are difficult to achieve with BRT. The policy fails in not acknowledging these mode differences or the way in which the land use and TOD objectives impact on the transit planning process and outcomes.

The real story of how TOD objectives influence the urban transit planning process and outcomes cannot be properly answered in a review of the formal policy or the project documentation however these documents do provide useful background and context.

The question of how TOD objectives influence the urban transit planning process and outcomes can only be answered by those who were actually responsible for the making of these transit planning and design decisions; they are the people within government and the project. Their experience is the subject of the next section of this research.

Table 5.3 Policy and Project Documentation Conclusions

PP1	The SEQ policy and GCRT project documents tend to be neutral on the philosophical and political issues in relation to TOD. The Concept Design and Impact Management Plan (CDIMP) acknowledges the SEQ TOD policy objectives without consideration of the development opportunities within the project or the transit corridor.
PP2	In spite of the significant body of SEQ policy and GCRT project documentation there is no consideration of the way in which the project structure or the process work as enabling factors for the transit planning or land use outcomes.
PP3	Mode is treated as neutral in the urban environment. Differences between BRT and LRT are not acknowledged nor related to impacts on the RASL outcomes. There is a failure to explain why one mode tends towards park and ride outcomes whilst another is associated with integrated land use and TOD outcomes.
PP4	There is no acknowledgement of the relationship between the RASL and either the MASC or the land use outcomes.

Chapter 6 – Interpreting the Interview Data

6.1 Overview of Chapter

This investigation of the Gold Coast Rapid Transit (GCRT) project provides a unique insight into the way in which integrated land use and Transit Oriented Development (TOD) objectives influence the urban transit planning process and outcomes. This chapter provides an analysis of interview data from seventeen key informants who have been involved in the shaping of the GCRT project over several years from the late 1990's up to early 2009 when the Concept Design and Impact Management Plan (CDIMP) was finalised. These seventeen people are not by any means the only people responsible for shaping the project but they do provide a valid and reliable cross section of informed views in relation to the TOD issues in the project. The data can be read with the documentary evidence from Chapter 5 to make a number of conclusions which are detailed in Chapter 7.

There are some issues in relation to definitions of terms that have been dealt with in the previous chapters that should be reiterated here. The first issue concerns the definition of TOD. The CDIMP explains TOD in relation to Council's planning policies and emphasises "best practice principles in promoting sustainable land use planning and superior urban design outcomes" (Queensland Government 2009d, p. 14). In this research transit design process becomes important, hence the idea of TOD and 'Development Oriented Transit' (DOT) as a planning process as well as an outcome. This view of TOD/DOT emphasises the importance of transit planning decisions that ensure route and station locations that support quality urban design, planning and accessible land use outcomes. This point is emphasised here as some interviewees have not used the term 'TOD', however what they are saying in relation to station focussed outcomes tends to fit with the TOD definition used here.

There are other terms used here that overlap with TOD. The term 'City Building' is used frequently in the interviews. There was a 'City Building Team' within the project responsible for integrated planning and urban design issues in the corridor and the term tends to be used with TOD in the interview data. 'City Building' is defined in the CDIMP as "strategically located investment in areas desirable to businesses, residents and visitors" (Queensland Government 2009d, p. 14). The finer grain definition of City Building developed within the

project emphasises three key objectives: the station place qualities, the whole of journey experience, including walkability, and the wellbeing of station communities including the creation of opportunities for local economic development.⁵

The terms Mode and System Characteristics (MASC) and Route and Station Location/s (RASL) are used by the author as shorthand to refer to these key concepts that are considered the two key enabling decisions in the planning and design process. They are not however specific terms that are used by the interviewees.

The interview data is structured to follow the research questions which have also shaped the structure of the literature review. This enables some comparison of the established and new knowledge. The policy and project documentation have also been structured to enable similar comparisons.

The research questions have structured the high level coding categories. Within these are sub-categories formed from the coded content of the interview data to enable a directed content analysis (note Section 4.3). There is also an analysis of comments in relation to whether the GCRT is seen as a transport project or a land use project, or elements of both.

In the summing up of each section the condensed comments and abstracted meanings are summarised and discussed with conclusions on the meaning of the data. The detail of the interview data is provided at Appendix G.

The final conclusions are developed in Chapter Seven where the abstracted meanings are cross referenced with the literature review and the policy and project documentation analysis to draw out the key lessons in relation to each of the research questions and to highlight how the existing knowledge is extended, enriched and/or enhanced.

Finally, it is evident in the interviews that people see things differently, with different recollections and will have different views about what happened, why, how and when. The process here acknowledges these differences but enables areas of agreement to be synthesised to develop an understanding about the transit planning process and outcomes.

⁵ Note that the author was employed as the Manager of the GCRT City Building Team in 2008, 2009 and 2010.

6.2 Transit Shaping Land Development and TOD Objectives

6.2.1 Introduction

The literature highlights a range of factors in the relationship between urban transit and land use outcomes. Transit planning decisions may enable park and ride outcomes around stations or those decisions may enable improved local accessibility and higher yield TOD outcomes. It is also evident that this process of influence and enabling is not one way and that the land use policy can and, in the case of the GCRT, does influence the transit planning process and outcomes. The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* This section addresses the first sub-question: *How does transit shape the urban environment and transit oriented development objectives in the corridor?* The interview data in this section addresses this question in relation to coding categories dealing with the transit/TOD tensions, the evolving land use objective, realising the development opportunities, and realising a transit oriented lifestyle.

6.2.2 The Transport/TOD Tension

Adjusting the transport planning objective to realise longer term TOD aspirations highlights the tension between the more complex, longer term, higher cost and risk land use and accessibility objectives and the simple transport time/speed imperative. It follows that there is a risk that the urban transit project is promoted according to its simple transport benefits rather than the complex TOD benefits and this was a challenge for the project from the earliest days of the idea:

I think we put too much focus on travel time, to be honest, we used that initially... to try and bring the councillors who were not convinced over the line, that we would reduce travel time, free up road space... but it seemed with some to become too much of a focus rather than on the renewal part... (Power: 4.12)

The focus on the transport objective at the expense of land use was noted as a feature of other major SEQ transit projects; the problems in achieving an integrated transport outcome is illustrated with reference to the development of the Robina Town Centre on the Gold Coast heavy rail line:

I think originally the heavy rail was perhaps a true example of an engineering solution and not an integrated engineering and planning solution... about moving people from Gold Coast to Brisbane as quickly as possible and it does that pretty well... so it is not truly a transit oriented solution, it is a transport solution nevertheless. (Case 12.7)

The focus on transport objectives to the detriment of the land use and TOD outcomes was noted by others for the Gold Coast rail line (Papageorgiou: 6.19), the Brisbane South-East Busway (Grose 1.37) and the bus lanes projects on the Gold Coast Highway (Deutscher 3.17). In each case the land development opportunity was not realised on account of the primary emphasis on the transport objective. Even in the case of the GCRT there is a view that the SEQ policy objectives dealing with integrated land use and TOD counted for little in the design of the project (Grennan 13.8).

The experience with other SEQ transit projects reflects a particular view of TOD, one where the development is intended to follow the transit rather than the transit following the development:

The TOD Task Force got itself bogged down because the Minister and the Department wanted TOD outcomes. What they were thinking of, they wanted to build something, whereas a lot of what we were talking about was transit supportive outcomes. (Rowe: 7.21)

The interview commentary highlights a view of transport/transit as siloed and simple whilst the integrated transport/TOD task is wider and complex. This is evident in the SEQ transit planning experience where the transport objective is paramount, hence the failure to realise TOD opportunities in major SEQ transit projects.

Table 6.1 below summarises the individual comments referring to the 'transport/TOD tensions' and these are reduced to an abstracted meaning (for example AM1 shows the first of these meanings). The coding is required to enable legibility of use later in Chapter 7 "Concluding the Thesis".

Table 6.1 The Transport/TOD Tension – Abstracted Meaning⁶

<ol style="list-style-type: none"> 1. There was too much initial emphasis on the transport objectives in the GCRT rather than the opportunities for urban renewal. (DP 4.12) 2. Transport operational needs with the Gold Coast rail line were put before the land use objectives. The project scope and budget was not consistent with these wider objectives. (MP 6.19, 6.20, 6.21) 3. Gold Coast heavy rail is an effective transport engineering solution but achieves operational efficiency at expense of land development opportunities. (BC 12.7) 4. The Brisbane Busway had TOD opportunities but they have not been realised as the route did not enable existing opportunities. (RG 1.37) 5. The brief for bus lanes transport project ignored the significant land use interactions which ultimately prevented that interaction. (KD 3.17) 6. There was a lack of formal interest in the SEQ integrated transport planning policy objective except for the specific commitment of project team members. (PG 13.8) 7. The state wanted development around the transit but we were talking about transit supportive outcomes. (WR 7.21)
<p>AM1 – The SEQ transit planning experience is seen as narrow and focussed on transport at the expense of wider integrated land use/TOD planning objectives. x7⁷</p>

6.2.3 The Evolving Land Use Objective

Earlier in the project the TOD objective is evident, albeit subordinate to the transport objective, and evolving through the course of the project (Power 4.10; Seymour Smith 16.7). The land issue is evident earlier in the project to the extent that there was a need for property acquisition (Carroll 8.6). There are varying views on when the issue actually comes to the foreground of the project, it may have come late (Chang 11.24), three or four years ago (Power: 4.23), 12 to 18 months after the design started (Seymour Smith 16.5), or after the start of the consultation period (Carroll 8.1).

The early project cost/risk focus is about the need to minimise short term property impacts; “When people think of land use in our consultation process they think of how to reduce the impact on the land because they think of the construction. It is really hard to envision, for the average person, it is the here and now” (Carroll 8.15). The focus on the short term “here and now” reflects the challenge of communicating longer term benefits over undesirable short term costs and impacts.

⁶ Note tables of abstracted meanings refer to all relevant comments in the coding category and are shown in full in Appendix G.

⁷ This number refers to the number of comments considered in relation to the abstracted meaning.

There are a number of events that are attributed to the 'evolving land use objective' and the federal government - Infrastructure Australia (IA) funding is a significant one. The GCRT funding application emphasised the City Building/Nation Building opportunities in the corridor and this was acknowledged with a contribution of \$365 million to the GCRT. The submission architect, Adam Boersma, notes that the first priority was to realise job creation through the early works package following the Global Financial Crisis impact on the city but the second driver was the City Building/Nation Building objective:

... the reason that the project had national significance was because it changed the city, the city economic drivers, talked about the knowledge precinct, the change in demography, and employment. We tied the City Building to the Nation Building because Nation Building was one of the criteria that Infrastructure Australia were looking for. (Boersma 9.1)

The issue of economic change and station oriented urban regeneration was a key component within this higher level objective (Boersma 9.2). The involvement of the federal government was a turning point for the project and its focus. Commenting on the role of land development and the City Building function within the project, GCRT Property Manager, Paul Grennan, notes the significance of this relationship: "when we had the money from Infrastructure Australia there was a drive to get City Building outcomes... that was an inspired decision" (Grennan 13.18).

The IA submission and contribution is significant but does not exist in isolation. The submission draws on Council's vision for the project and importantly on the international experience with urban transit. There are acknowledgements of the European experience with transit corridor transformation and evolution (Kozlowski 10.6), the French experience with transit and urban regeneration (Deutscher 3.35), and looking to Asia and cities such as Hong Kong regarding understanding the longer term urban development that occurs with the development of the transit system (Molhoek 14.18).

Whilst the TOD objective has been evident in the project objective from its inception the project planning and design can be seen to have been initially dominated by transport objectives. The longer term TOD/city building focus is an evolving idea and related to a number of factors, but notable is the federal government's IA funding decision and the City

Building/Nation Building focus. Issues of mode and system characteristics (MASC) and the route and station locations (RASL) are discussed later in the analysis and these too can be seen to have been significant in their impact on the evolving land use objective.

It is also notable that the thinking about the land use and TOD opportunities are shaped by the experience of other places, such as Europe, and that the participants in the project see the potential of this urban transit project in this international context.

Table 6.2 The Evolving Land Use Objective – Abstracted Meaning

The evolving land use objective
<ol style="list-style-type: none"> 1. The land use opportunity was not initially evident, the discussion was more technical. As the project becomes certain and issues are resolved then the land issues develop. (LSS 16.7) 2. The land use component was not recognised immediately, it was an evolutionary thing. The need to deal with traffic gridlock in key centres initially drove the project. (DP 4.10) 3. Initially the projects property focus was about land acquisition for the corridor. The wider land use thinking in the project on this occurs over the 2008 period. (AC 8.6) 4. The public realm thinking came late. The mode and station locations are right but the project lacked a modern light rail culture so it has been a learning curve to get everyone on board. (MC 11.24) 5. The business community have only started to understand the land use opportunities within the last few years. (DP 4.23) 6. Translink had a very narrow focus on the project feasibility in that corridor. It was twelve to eighteen months before there was a focus on the project as a catalyst for change in the city. (LSS 16.5) 7. The project did not understand the city transformation and land use objectives until after the consultation, the mobilisation of the business community, the federal money and the push for future stages. (AC 8.1) 8. The public's understanding of the land issues was about constructions impacts. They are focussed on the here and now and that the project will hurt them. Later on there was an understanding about the future development opportunities in Southport. (AC 8.15)
AM2 – The project was initially focussed on transport objectives. The land development and public realm focus came later. x8
Focus on regeneration and development
<ol style="list-style-type: none"> 1. The project had national significance because it changed the city. City Building was tied to Nation Building because that was what the government was looking for. (AB 9.1) 2. The federal government interest was about a change towards land use and economic regeneration. (AB 9.2) 3. When we had the money from IA, there was a drive to get City Building outcomes, and I thought that was an inspired decision. (PG 13.18) 4. The European experience shows many decades of corridor transformation and evolution. (MK 10.6) 5. French light rail route planning is focussed significantly on the opportunities for urban

- regeneration and redevelopment with penetration into the centre. (KD 3.35, 3.36)
6. Public transport systems, such as in Hong Kong, take generations to develop and they have to grow with the city, so as the city grows so too will the transit system. (RM 14.18)

AM3 – The Nation Building and international experience confirms the wider and longer term transformative City Building and TOD objectives. x6

6.2.4 Realising the Development Opportunities

There are various views about what the TOD objective means in the project. For some they are the higher level, longer term City Building benefits and there are those with a shorter term view of the opportunities and see the land issue from a cost/risk perspective.

A key development opportunity, albeit one constrained by limited legal powers, was the use of residual land parcels from the corridor property acquisitions. This process provided sites which could potentially be consolidated into viable development opportunities attractive to the industry and which would build the financial viability of the project. The substantial acquisitions were most often around the transit stations, a consequence of corridor flaring, providing large and often highly viable corner development sites. Infrastructure Australia was particularly focussed on realising these opportunities, “they were all over the residual sites and whether we could redevelop the sites in a way that we could capture the value and pump the money back into the funds” (Boersma 9.3).

The concern to ensure that TOD and Land Value Capture (LVC) opportunities were realised, focussed attention on the possibility of a land development model that goes beyond the conventional local government planning response:

We only look at patronage to support light rail and there are other ways to generate the funding needed to get light rail out of the starting blocks. The lack of acknowledgement that light rail leads to an increase in land values leads to lack of utilisation of Land Value Capture as a funding mechanism for future stages. (Grennan 13.17)

After the federal government came into the project as a partner with its \$365 million and a desire to generate an equity return, i.e. profit, the focus on various land development options sharpens with a view to realise commercial and development opportunities, this view achieves traction with key partners in the project:

... even the Treasury guys could see the benefits of what the Feds were trying to do, the idea that public transport is a profitable exercise because it takes people to where you want them to be so they buy in stores that you want them to buy in so you can rent the sites to storeowners. People can see the commercial benefits of that. (Boersma 9.8)

This idea of adding LVC and the light rail development potential to the transport value goes back to the earliest days of the project feasibility (Bitzios 2.23). There is strong interest in the ways of realising LVC and including the need for recognition in the project Terms of Reference (Papageorgiou 6.27) or by placing the corridor under a separate act (Power 4.24).

Development models are discussed including the Japanese rail corporation as the land developer (Papageorgiou 6.26) or the Queensland Urban Land Development Authority model, or other land development powers to influence long term outcomes (Rowe 7.17).

There is an evolving recognition of the importance of the TOD opportunities in the corridor, over and above the patronage opportunity. There is also a concern, from the conception of the project and through the course of the project, that the existing development powers are not realising the land development potential in the corridor and are not producing benefits for the project or the community, hence the interest in alternative governance models.

Table 6.3 Realising the Development Opportunities – Abstracted Meaning

Land development compensates for LRT

1. The Feds were concerned with the long term agenda, the land development opportunities from the residual sites. (AB 9.3)
2. What was missing was that we were only looking at patronage to generate funding. Light rail leads to an increase in land values. Property developers may get the windfall instead of the project because the government is not there. (PG 13.17)
3. Even Treasury could see the longer term benefits of land development, with the right alignment and development tools it could have been very profitable. (AB 9.8)
4. Land development opportunities are seen as compensating for the higher LRT costs but are rarely taken into account. The 2004 Feasibility Report focus was on city building, city image and intangibles over and above transport objectives. (DB 2.23)
5. If the Terms of Reference include potential development of adjacent land then the project can realise the higher integrated regional transport objectives but if the budget is too narrow, i.e. patronage oriented, then the opportunities are not realised by the project, but by others. (MP 6.27)
6. There was concern that the route will not realise its potential because of parochial politics and planning policy constraints, hence need for separate authority. (DP 4.24)
7. Japan is a great example where the owners of the rail line also develop the property.

Focus on performance indicators that go beyond patronage. (MP 6.26)
8. Examples from other cities underpin a preference for a Land Development Authority model so that the long term planning and development potential of the corridor can be realised. (WR 7.17)
AM4 – Light rail projects coupled with a longer term vision and the right land development tools can realise significant financial potential. x8

6.2.5 Realising a Transit Oriented Lifestyle

The discussion of how TOD objectives shape the transit planning process and outcomes expands into wider lifestyle issues of access and mobility and car dependency. Interviews highlight a tension between those who want to maintain the car and the status quo versus those with an alternative vision for the city. This tension highlights the different transport experiences in different geographical areas of the city and the different concerns; that is the higher density coastal centres have a different view of transit compared to outer suburbs.

There are two issues that arise in the commentary; the first is that of an entrenched view of a Gold Coast lifestyle oriented to the car. The second is an alternative transit oriented lifestyle and image for the city.

Beyond the Car Oriented Lifestyle

The Gold Coast developed mainly in the post-war period when car ownership was becoming widespread and trams systems were being pulled out of Australian cities. Despite a tendency to generalise the relationship between the car and the city there are differing experiences reflecting the different layers to the city; the dense lineal edge city: the corridor for the light rail, to the immediate west are highly segregated and fragmented river and canal estates, further west are the low density suburbs, the M1 motorway and the hinterland.

Overall the city of 'Metre Maids', Indy/V8's, 'drive thru' motels/hotels, strip shopping and the original coast road/Gold Coast Highway are elements of an urban space and culture that has been defined by the car, "the Gold Coast is built around the car... here people still love their cars" (Kozlowski 10.18). The love affair with the car extends into the issues of personal rights, so the debate around urban transit challenges the thinking about how people get around and the thinking around the car as a right rather than a privilege (Molhoek 14.14).

Those who live well outside the transit corridor may see their lifestyle threatened even where they are unlikely to experience changes to their car oriented/dependent lifestyles, “clearly people who live in Upper Coomera are not concerned about the benefits of higher density and if people want to take their car to the supermarket to load up then that is a sensible way to do it” (Grose 1.40). There is a concern to pitch the transit project as a balance to the car, “the desired response was that as a growing city we want efficient and capricious roads and public transport choices as well” (Papageorgiou 6.9).

The relationship between the car and a complementary urban form arises. Such is the Gold Coast urban form, with planning by Queensland Rail, that accessing the heavy rail generally requires a car as rail stations are located out of centre in substantial ‘Park and Rides’. The GCRT is focussed on centres where parking is traded for access and density. In practice such principles may be difficult to realise:

I think there has been quite a lot of conflict there and that comes back to that Gold Coast example where I said there was strong support in a strategic sense for land use planning integration and getting mixed use and high densities, but on a case by case approval the traditional concerns came into play... . (Papageorgiou 6.22)

Some have a firm view that Council had a responsibility to provide parking (Baildon 5.15) and some are concerned that Council may underestimate the car parking demand in the corridor (Case 12.19). In support of this position is a view that the supply of car parking is traditionally related to land value (Bitzios 2.44) so the prevailing community view of parking that follows is ‘more is good’:

When the client and the architect sit down they talk to marketing people and so on, and still the thing for residential is that they have got to have car spaces, in a lot of cases they say we need more, less for the commercial and more for the residential. So there is still this mindset that you have to have a car and maybe that will change when the system is in place. (Brooke 2.45)

Alternatively, there is a view for reduced car parking and GCRT is a vehicle to achieve this (Rowe 7.24) and there is a view that the change is underway, “we also have to look at a changing generation that is more socially conscious so we are seeing a trend away from car dominance and that is why you do need these other options” (Seymour Smith 16.17).

The entrenched car culture on the Gold Coast can be seen as a risk for the project although the car culture is mainly evident in outer, low density, car dependent areas but is also evident in the GCRT corridor. The light rail project is seen as an opportunity to change this culture and to provide a transit oriented lifestyle choice as part of a wider cultural change.

A Transit Oriented Lifestyle and City Image

The interviews highlight a concern to ensure that transit project is seen as a means to the end “to some degree the transit is less important than the associated benefits attached to it, primarily you can be a bit agnostic about the mode because the primary decision is a lifestyle decision” (Deutscher 3.15). Transit is seen as a catalyst for compact, mixed use, urban development that is designed to enable a walkable lifestyle, and this extends to the point that the transit itself is potentially irrelevant to that walkable lifestyle (Grose 1.19).

The idea of the light rail contributing to the city as a great place to live and building on the lifestyle opportunities is important so light rail stations need to be well located “a TOD is better to be anchored close to the beach, shopping, recreations” (Brooke 2.50) and that lifestyle needs to contribute to a cleaner environment (Grennan 13.14; Molhoek 14.15) and to support a more connected and comfortable experience (Deutscher 3.15; Molhoek 14.17).

There is recognition of the way in which the transit station is important in the urban environment in terms of its contribution to a sense of place, places of “multiple activities, where people will play, work, there will be a feeling of safety” (Grennan 13.14), and meeting places “where people congregate in the city” (Kozlowski 10.17).

The commentary emphasises an attractive, European, urban, cosmopolitan experience. The lifestyle benefits dovetail into the tourist experience and the desirable image of the city (Papageorgiou 6.30). This is not however only a land use or city building view; it extends to a transport/traffic planning view of the project:

Surfers Paradise was split, and we had three lanes of relatively fast moving traffic moving through the centre of Surfers Paradise and I think some people may have twigged, “was that a good thing?” and was it the way they wanted to see the city in the future. (Grose 1.10)

The light rail is part of a stronger image of the city and, the reputation of the city “I think this will go a long way to change our credibility at national level so long as long as people capitalise on it” (Power 4.25).

The project is seen as changing the urban environment but also culturally entrenched behaviours about the car. The light rail is associated with better lifestyle, choice, equity, pride, a positive tourist image, and improved perception of the city and this is contrasted with the future of traffic congestion and the degradation of the city because of traffic.

The entrenched but changing Gold Coast car culture can be seen as a risk and an opportunity for the project but the light rail is also a catalyst to change this. There are younger people with different values and lifestyle aspirations, people who desire transit oriented - sustainable lifestyles and/or the high density, high access beachside lifestyle. On the other hand are those many people who have made their choice in favour of the car oriented outer suburban lifestyle and who place considerable value on car parking and this is an issue in the GCRT planning.

There is no one Gold Coast transport experience or lifestyle and it is evident that there is a risk in assuming that the wider community really understands the purpose of the light rail beyond its ‘Sexy- Euro’ image in the Gold Coast urban environment. Nonetheless the LRT image is important and is related to a desired, albeit idealised, Gold Coast lifestyle choice.

Table 6.4 Realising a Transit Oriented Lifestyle – Abstracted Meaning

Beyond the car oriented lifestyle

1. Other cities have strong public transport culture but the Gold Coast is built around the car, the challenge is to change that thinking. (MK 10.18)
2. Driving convenience is a privilege and comes at a price. (RM 14.14)
3. There was community concern around the loss of driving and parking access. The policy response sought to provide a balance between car and public transport choice. (MP 6.9)
4. There is no expectation of a change to car use in the outer suburbs but on the high density coastal corridor a lot of journeys will go onto the light rail. (RG 1.40)
5. The objective of reduced car parking as part of a higher level integrated planning solution is in conflict with community concerns. (MP 6.22)
6. Council has responsibilities for [public] car parking but there are funding limits. (GB 5.15)
7. We should not under estimate the demand for parking. Without a parking strategy there may be negative impacts on local business near stations. Park and ride for LRT will

- have significant land impacts, so should consider car parking at major bus hubs. (BC 12.19)
8. Everyone has struggled with a change in culture and thinking about the relationship between land value and the shift from car access to public transport access. (DB 2.44)
 9. Car parking is important in new development, but maybe a change after light rail. (SB 2.45)
 10. Project is a 'stalking horse' to revise parking policy as part of a wider development approach in the corridor, different to that advocated elsewhere in the city. (WR 7.24)
 11. Car culture is entrenched but there is generational change so the trend is moving away from car dominance so we need other transport options. (LSS 16.17)

AM5 – The car and the right to parking are seen as part of the Gold Coast lifestyle. Light rail is seen as a catalyst to change the culture and land use in the corridor x11

A transit oriented lifestyle.

1. It is about the system connecting up those places you want to go to, it's about a different lifestyle, about access to opportunity. (KD 3.15)
2. The development pattern is about an accessible lifestyle, not just about transit. (RG 1.19)
3. TOD is not just about being at the station. It needs to be a desirable place to live, near attractors such as the beach, shopping, recreation. (SB 2.50)
4. Station places will be dense, active places providing for work and social benefits with improved environmental benefits but this change will be hard for people to grasp. (PG 13.14)
5. Need to look at LRT environment and ask how we are contributing to a cleaner environment. (RM 14.15)
6. Improved walkability with trees and shade is important with public transport. (RM 14.17)
7. Station places will be permeable, accessible, social and attractive for people to congregate. (MK 10.17)
8. Light rail image will be attractive to tourists with a perception of fun and novelty. (MP 6.30)
9. Concern that the image for Surfers Paradise was about traffic and gridlock, and that this was not consistent with the desired image for Surfers in the future. (RG 1.10)
10. Light rail will alter the land use and the perceptions of the city and potentially the credibility of the city at a national level. (DP 4.25)

AM6 – The light rail will provide desirable, connected and accessible lifestyle choices and contribute to a positive tourist image and the wider perceptions of the city. x10

6.2.6 Abstraction of the Condensed Commentary

This section provides an overview of commentary from the interview material in relation to the first research question: *How does transit shape the urban environment and transit oriented development objectives in the corridor?*

The GCRT design process was seen to have evolved from one concerned for the transport objective to one where land use was a significant objective. The thinking shifted from

thinking of land as a cost/risk to being a benefit and from short term costs and risks to long term benefits. The scope went beyond the transport task and even beyond land development to consider city image, a transit lifestyle and transport choice.

The following table provides the condensed narrative from the interviews and provides an abstracted meaning; these are dealt with later in the next section. Each abstraction is shown with the number of relevant comments, for example x7. Appendix G provides the details of the relevant comments which have been selected based on their significance to the research question.

- Abstraction #1 – The SEQ transit planning experience was focussed narrowly on transport objectives at the expense of wider integrated land use/TOD planning objectives. x7 comments.
- Abstraction #2 – GCRT project was initially focussed on transport objectives. The land development and public realm focus came later. x8 comments.
- Abstraction #3 – The Nation Building and international experience confirms the wider and longer term transformative City Building and TOD objectives. x6 comments.
- Abstraction #4 – Light rail projects coupled with a longer term focus and the right development tools can realise the significant financial potential for land development. x8 comments.
- Abstraction #5 – The car and the right to parking are seen as part of the Gold Coast lifestyle. Light rail is seen as a catalyst to change the culture and land use in the corridor. x11 comments.
- Abstraction #6 – The light rail will provide desirable, connected and accessible lifestyle choices and contribute to a positive tourist image and the wider perceptions of the city. x10 comments.

The discussion of the meanings in relation to the literature review and policy and project documentation evidence is conducted in Chapter Seven.

6.3 The Transit Planning Structure and Process Enabling TOD

6.3.1 Introduction

The literature highlights a transport planning profession that is traditionally siloed, highly specialised and unable to realise integrated planning outcomes consistent with TOD. This section considers the way in which the transit planning structure and process shapes the GCRT project to enable TOD outcomes. The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* This section addresses the second sub-question: *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?* The question here is addressed according to the coding categories dealing with the institutional enablers, professional collaboration and balancing the land use and transit objectives.

6.3.2 Institutional Enablers

The significant role of Council in setting the regional planning policy agenda is a strong theme in the commentary. Public transport is not a local government responsibility outside of Brisbane City Council but the Gold Coast City Council (GCCC) officers and councillors see themselves as having taken a lead role in progressing the light rail concept effectively as an extension of their activism at the regional level in the land use and transport planning policy development as well as reflecting the significant development pressures in the city. GCCC produce the first of the Local Transport Plans under the Integrated Regional Transport Plan (IRTP). David Power, former councillor, Deputy Mayor, referring to the SEQ - IRTP states:

I am fairly certain that the IRTP was well and truly informed by us... there was no doubt at all that we had sowed the seed between that period of 1994 and 1996, without a doubt... a lot of the IRTP actually developed out of Councils asking the State Government for that type of overarching planning process, so by and large they picked up work of the Councils and overlayed it. (Power 4.8)

This view on the leadership role of GCCC in regional planning policy is shared by a number of senior Council officers (Brooke 2.6; Rowe 7.8) and others acknowledge the partnership with the state government (Baildon 5.2; Papageorgiou 6.13). Key elements of the state's Regional Framework for Growth Management (RFGM) policy such as "densification, consolidation,

mixed use and multiple choices in terms of transport options” were “exactly” aligned with the GCCC policy (Papageorgiou 6.7).

The proactive role by Council in the transport and land use planning policy, and with particular regard to achieving TOD, is attributed to its integrated structure as opposed to the “structural impediments” and “financial impediments” of the state government (Rowe 7.8) highlighting the problems of state organisations such as Queensland Transport taking a holistic view of the integrated urban transport and land use/TOD opportunities.

While there is enthusiasm for the possibilities around the integrated transport and land use planning policies there is also cynicism about the state’s ability to follow through with the funding of the light rail highlighting a gap between the intent and the available funding (Grose 1.4; Case 12.6) extending to a perception of the state’s lack of genuine interest in the light rail concept itself as “ho hum – stick it in the drawer” (Baildon 5.10).

The progress with the land use and transport policy is very important for Council and the relationship with the state certainly seems to underpin the sense of progress in this area. Council’s Manager for Strategic Planning from 1996 to 2004, Michael Papageorgiou, notes:

The shift that I can recall was that the Councils certainly felt that they had proposed a desirable framework for the region, that the State had embraced it and became more enthusiastic over time, and that eventually led the Council’s statutory regional plan that the Councils wanted for a long time, so there was a sense of a real partnership, and I think it was in a sense, the economy was growing, was very positive, and it was a sense that all these things are achievable. (Papageorgiou 6.13)

Papageorgiou highlights a mood for change which is also evident in the state policy development in the mid to late 1990’s and Council is proactively driving this change. The relationship between the parties is cooperative and positive. Note that this is also a time when the ideas of New Urbanism and TOD are gaining attention and can be related to the new thinking about land use and transport planning in Council and the state.

In this period the institutional enablers can be seen to align between the Council and the State. The new council is larger, better resourced and proactive and demonstrates leadership for planning policy reform in the region. This extends to the advocacy for the light rail investment supported by complementary land use planning.

Table 6.5 Institutional Enablers – Abstracted Meaning**Council leads the integrated planning**

1. The IRTP was 'well and truly' informed by Council; much of the planning policy was actually done by Council. We also had the benefit of ministers that understood what Council did and the need for longer planning horizons. (DP 4.8)
2. The City Transport Plan was the first integrated plan and followed the IRTP. Previously the transport planning was done every two to three years by the Main Roads Department and was 90 per cent road based. (SB 2.6)
3. Council is ahead of the state in many areas and not afraid to enter and lead the debate. In relation to TOD the state are caught up in the structural and financial impediments to TOD. (WR 7.8)
4. The CTP was a thirty year plan, and contained the light rail project. Council adopted the plan unanimously and it was carried unanimously every time it was put to Council. (GB 5.2)
5. Council felt that they had proposed a desirable framework for the region and it was embraced by the state and this led to Council's statutory regional plan. There was a positive view of the partnership and a sense that things could be achieved. (MP 6.13)
6. RFGM framework encouraged density, consolidation, mixed use and transport choice and exactly aligned with Council's thinking about the transport objective. (MP 6.7)
7. There was a lot of scepticism about the financial side of the project (RG 1.4)
8. The planning for SEQRP infrastructure planning is well advanced but funding is not. If Council could support the project and put money in then it would probably get the state to fund the project. (BC 12.6)
9. Following the light rail launch [1998] there was a view that the state was not being serious about progressing the project. (GB 5.10)

AM7 – Council had strongly influenced the state government's transport and land use policy objectives. Council initiated the light rail concept in that corridor to progress its land use planning objectives. x9

6.3.3 Collaborative Behaviour to Realise the Integrated Planning Outcomes

Realising an integrated transit and land use outcome for the light rail project, consistent with realising TOD objectives highlights the need for an integrated planning process. The commitment to realising integrated outcomes goes back to the early policy development between sections of the local government community:

...there was integrated transport planning being done across the southern area of SEQROC [SEQ Regional Organisation of Councils] and it was not just about roads it was also about transit and the idea of a light rail was already there, and was already being considered. (Papageorgiou 6.4)

The integrated planning approach ties the land use and transport objectives together (Deutscher 3.7) and this idea is distinguished from the 'pure' transport objective:

A pure transport objective is logistical, move X people from A to B ... Back up the tree the true integrated transport planner... how we move the people is secondary to where we have to move and the lifestyle they are expecting to have... (Deutscher 3.19).

The integrated planning approach recognises the need to engage beyond transport planning engineers to include a wider range of professional groups including: urban designers, architects and planners; and this was evident in the decisions about the GCRT route and station locations (Case 12.17). The logic of the integrated planning approach seems clear however the practical realities of this integration seem to be less so.

The light rail project is a signature project in the City Transport Plan (CTP) and is initially being driven by Council's transport planning branch (Power 4.4; Baildon: 5.8). Transport planning tends to be focussed on engineering outcomes and this has important implications for the way that the project is being seen to be delivered. Michael Chang, a civil engineer recruited to Council's transport planning team from the light rail project in Montpellier, France, highlights the different ways in which engineers and planners tend to view transit:

By tradition the engineers will try and build something efficient in the construction and operation which has a very limited focus on the product that they are trying to deliver and the land use planners will have a much more holistic approach to that. (Chang 11.10)

Whilst transport planning has an influential role in the early shaping of the light rail there are other competing visions from other professional groups, at least within Council (Brooke 2.41). These different professional views around the integrated planning outcomes may be a source of tension and disruption in the project and need to be managed.

The interviews point to how realising integrated planning outcomes requires a collaborative process and this can also be seen as an important learning curve for the project. In the very early Council planning phase the high level policies for the (1998) CTP and the GCCC Planning Scheme Policy are being developed between land use and transport planners, working "... in close proximity, sharing the research documents for the transport and the new planning scheme... it was a very high level of collaboration" (Papageorgiou 6.6).

According to Steve Brooke, a Senior Transport Planner at the centre of Council's light rail planning, at that early planning stage, "we were part of PET [the Planning Environment and

Planning Directorate] so not there just to look at transport, but there to also look at land use" (Brooke 2.11).

The collaborative environment that shapes the early policy achievements in the transport, transit and land use policy area are related to the particular institutional arrangements of Council where transport planning sits alongside land use planning within the PET Directorate. The architect of the then, newly amalgamated GCCC, the first CEO, Doug Daines, himself a land use planner with a vision for integrated transport, is credited with creating the structure. The Director of PET, Warren Rowe, notes:

So that was, back then in 1995/94 that was some very progressive thinking. I don't think people realise exactly what he had done, because the transport and the transport planning function normally sat in the capital works area of Council, so pulling it out and recognising it as a strategic policy area and linking and embedding in the land use policy area has really been the strength, and it is interesting that that relationship has not changed at all. (Rowe 7.5, 7.6)

The integrated and collaborative culture of PET is apparent as the GCRT project design moves in to the CDIMP process. Chapter Five of the CDIMP, detailing the urban design framework, was facilitated by Council's Transport Planning branch through a cross council GCRT Reference Group. This was seen as a positive for the design outcomes. Urban Design Team Leader for Council, Marek Kozlowski notes that:

We probably tackled all the major issues that relate to urban design and we talked about placemaking techniques and stations so they are located for place making, about the impact of the light rail on surrounding development so definitely found the Reference Group very fruitful, beneficial. (Kozlowski 10.2)

The collaborative environment in the project develops and is seen as productive (Grose 1.33; Papageorgiou 6.6; Case 12.17). It is also evident that there are external partnerships that have been developed reflecting a collaborative culture, "It wasn't until about probably... about 2003 that they [development industry] started to help us to lobby the state government, started to be on board to be part of it" (Power 4.14).

In contrast to the 'nimble' council planning environment the GCRT project delivery team is formally created under the management of Queensland Transport (QT) in late 2006. QT is typically structured as a bureaucracy with policy and discipline silo's to realise the transport objective and this can be a barrier to an integrated planning solution. (Rowe 7.9, 7.10).

It is evident that the collaborative environment that underpins the integrated objectives of the project takes time to develop. Early in the CDIMP process there is concern about the various groups and interests that are not integrated with concerns about the level of accountability to the community for project decisions (Carroll 8.3). This recognition of community concerns also broadens the project focus to address a wide range of issues beyond transport (Seymour Smith 16.20). The GCRT Communications Manager, Anna Carroll, discusses the learning process around the collaboration:

It was too fractured so you never got a one voice approach; you never had a discipline leader that went across all the disciplines... We then started to understand and learn that you needed to bring to the communications team the engineering and the urban design... We then had the transport modellers lob in on it which was MWH, but at that stage you also had a person, a skill set in Leon Seymour Smith. (Carroll 8.5)

It is evident that the evolving culture of professional collaboration becomes empowering for the project and important for realising the objective of a well-located transit system in a dense urban environment. Civil engineer and technical design leader for the GCRT, Leon Seymour Smith, points to the balance of planning and engineering objectives through the collaborative process to realise the more ambitious and often difficult outcomes, “to break some eggs and make this thing work instead of that treading softly” (Seymour Smith 16.22).

An integrated project objective where planners come into the transit design space alongside engineers highlights the different professional views and issues of leadership roles:

It is always hard to know who should come along first. Should the planners dictate how the transit system should be rolled out or whether the engineers tell the planners that this is the best location from a constructability point of view and how they might want to plan the city around that. I am not sure if there is a right answer. (Case 12.4)

The interviewees highlight the relationship between complex integrated planning objectives and an integrated and collaborative planning process. The quality of the integrated solution can be related to the quality of the integrated process. This relationship can be seen as one that evolves with the project and is tied to the opportunity to realise improved outcomes, including TOD.

Table 6.6 Collaborative Behaviour/Integrated Outcomes – Abstracted Meaning

An integrated approach

1. The early integrated transport planning response by local government focussed on transit and light rail and this was taken into account in the land use planning area. (MP 6.4)
2. Firstly you need to have strategic thinking, and secondly, you have the principles in urban planning. It is about an integrated planning concept, as much about land use as it is about transport infrastructure. (KD 3.7)
3. The pure transport objective is different from integrated transport planning where the movement of people is secondary to the issue of the destination and the lifestyle. (KD 3.19)
4. In relation to the RASL it was an integrated approach; engineers, urban designers, architects, planners. (BC 12.17)

AM8 – An integrated transport planning approach involves strategic thinking across a range of professional groups and objectives. x4

A collaborative approach

1. As part of PET we needed to look at both transport and land use, there was a lot of collaboration there. (SB 2.11, 2.14)
2. The collaboration improved once we learnt to get everyone in the room together to get a one voice approach. (AC 8.5)
3. It is difficult to know who is on top; planners or engineers? You are never going to see eye to eye in that space but if you can get the parties together at the same time you can tick most of the boxes. (BC 12.4, 12.5)
4. The planning work was being done by teams working in close proximity and sharing the research documents so there was close alignment and a high level of collaboration. (MP 6.6, 6.7)
5. Collaboration focussed on future development and associated station locations. (RG 1.33)
6. Council's Reference Group was very fruitful and beneficial and was focussed on placemaking and urban design around the stations but some outcomes (such as the underground hospital) station were against the urban design principles. (MK 10.2, 10.3)
7. After 2003 the development industry helped Council to lobby the state for light rail. (DP 4.14)
8. One of the problems of bureaucracy is discipline silos and policy silos. (WR 7.8, 7.9, 7.10)
9. Wider engagement with the community was part of transition process from design to project and in this we start to look at land use, community and economic benefits. (LSS 16.20)
10. Transport planning was best located within the planning directorate and part of the strategic policy area, rather than the capital works area. Linking land use and transport policy has been a strength for Council. (WR 7.5, 7.6)
11. Planning and engineering coming together leads to more questioning of the route decisions and building the confidence to make bolder decisions for a better project. (LSS 16.22)
12. Need to defend the community interests and to make sure that the engineers and the

urban designers are held to account for their decisions. (AC 8.3)
AM9 – The collaborative culture comes out of a structure and process that engaged different professional views, levels of government and the community. x12
Professional groups driving the project <ol style="list-style-type: none"> 1. Transport planning area drove the project. (GB 5.8) 2. Council had different views about the project: Transport planning was more excited than the planners. Economic Development recognised that it was a catalyst to change the form and function of the city. Engineering Services were unhappy because it affected their roads. (DP 4.4) 3. In the beginning of the CDIMP phase the urban designers were leading the project but there was no interface with the engineers. Over time we got a better balance. (AC 8.4) 4. Engineers traditionally focus on efficiency in construction and operation, whilst the planners will have a holistic approach but because of time and budget constraints they were not heard in the design development stage, not until the feasibility phase. (MC 11.10) 5. Council was probably divided with competing visions amongst the wider professional groups in development assessment and engineering. (SB 2.41, 2.42)
AM10 – In the pre-CDIMP phase Council transport planners were driving the project in collaboration with land use planners. In the CDIMP the collaboration develops as land use opportunities become clearer, with planners and urban designers working with engineers and transport planners. x5

6.3.4 Balancing the Land Use and Transit Objectives

The integrated planning objective requires that otherwise competing objectives be balanced and resolved. The project was faced with many choices and challenges between the easy transport solution and the better land use solution. The first GCRT Project Director, Ken Deutscher, comments on this problem:

So where you do get conflict is around “that is too hard, too expensive” which was... the Gold Coast [heavy] rail line put in the bush [in the 1990s], because they did not want to go into the middle of town, because it is all too hard... we did not quite get to the town centre, because that last mile was too expensive. So the train station ended up on the edge of the town... That’s a problem with the thinking, that’s not a problem with the land use or the transit. (Deutscher 3.21)

The difference comes down to the project brief: What is the project prepared to pay for?

The Gold Coast heavy rail line comes up again in relation to the planning for the Robina Town Centre where the rail station was located 1 kilometre away from the town centre. It is argued that this outcome is not a problem about integration with the land use, but rather a conflict about project delivery, that the project scope was set to a budget, not an outcome, so the outcome was sub-optimal (Papageorgiou 6.21). There are also constraints in the

transaction process and the need to provide tight project scope definitions for more reliable outcomes:

I think when you get the pressures of meeting the financial hurdles and you need to get more and more definition around the scope in order to price it properly for PPP Co, to get bids as accurately as possible you narrow that, the nice to haves become can't haves through that integrated bid process, and so if you just look at the scope of the project then someone could argue that it is now just a transport project. (Boersma 9.9)

The need to resolve the alignment option is seriously debated and a source of tension for those within the project team:

So then, ... going through the debate around the alignment, the land use really came into play, ... the debate going around the centres, taking the easy way, the engineering way versus the land use transformation potential... *And how vigorous is that debate of one option over another, a transport planning option over a land use option?* It was pretty heated, yeah, I think there were pretty heated debates... maybe the framework was not particularly adapted to what we wanted to achieve... but I think we ended up with the right decision. (Chang 11.5, 11.6)

The idea that there may have been professional tensions, especially between transport and land use planners in relation to competing objectives for the project was discussed and the view was that indeed they did exist but they should be seen as healthy:

There will always be those tensions and I actually think that that is a really good thing... provided that those tensions are moderated within the context of looking at integrated outcomes. (Rowe 7.7)

You always have those tensions within the project and it is useful to have those tensions. You can't lose sight of the transport benefits but as we have often discussed when you are talking about people then it is difficult to differentiate between a mode where you are moving people around, and where they want to go, so light rail in that sort of system is inextricably linked. (Poole 15.9)

The GCRT CDIMP, following the SEQ policy, emphasises the desirability of integrated transit/TOD outcomes. The commentary makes numerous references to the lack of TOD/integrated outcomes in other SEQ transit projects. These failures may be a consequence of narrow project scope and budget but the question arises as to who or which department determines this scope and who advocates for the integrated land use and TOD outcome and whether project culture allow for these debates to take place consistent with an integrated and collaborative project team environment.

Table 6.7 Balancing Land Use and Transit Objectives – Abstracted Meaning

Balancing the land use and transit objectives

1. Conflict in the RASL decision making process about easy, cheap, edge alignment such as the Gold Coast heavy rail line versus going to the centre. It is not a problem with the land use or the transit but with the thinking. (KD 3.21)
2. Transport operational needs with the Gold Coast rail line were put before the land use objectives. The project scope and budget was not consistent with these wider objectives. (MP 6.21)
3. This was always a land use project, always about the city, the bidders got that but if you look at the scope of the project then you could argue that it was just a transport project. (AB 9.9)
4. The land use came into play in the debate over alignment options, the easy way versus the land use transformation potential. The framework was not adapted to what we wanted to achieve with land use but we ended up with the right decision. (MC 11.5, 11.6)
5. The professional tensions are always there and that is a really good thing provided that they are moderated within the context of an integrated outcome. (WR 7.7)
6. There has always been tensions between the land use and transport planning objectives and it is useful to have them, what we have learnt is that a lot of SEQ projects have been planned assuming land use will happen later but that is not occurring. (TP 15.9)

AM11 – There are project tensions between transport and land use objectives and there are related professional tensions which can be positive but need to be resolved within the context of an integrated planning outcome. x6

6.3.5 Abstraction of the Condensed Commentary

This section provides an overview of commentary from the interview material in relation to the second research question: *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?*

The light rail project was conceived within Council and within an integrated land use and transport planning environment, and the commitment to light rail therefore served both Council's transport and land use objectives. Council saw itself as having the right policy structure and a proactive position on integrated transport and TOD. The culture of collaboration was established in Council on account of the integrated transport and land use structure and is recognised as an evolving feature within the GCRT project, albeit from a siloed and structured environment.

The land use and transport objectives may have been in tension as were the roles of transport planner/engineer and the land use planner/urban designer, but in the integrated and collaborative team environment the tensions were seen as productive. The GCRT is contrasted with other major SEQ transit projects which were seen to have fallen short of the policy objectives on their integration into the urban environment and this was related to structures reflecting a specialised and siloed transport focussed project scope and budget.

The list outlines the condensed narrative from the interviews and provides an abstracted meaning; these are dealt with later in the next section. Appendix G provides the detail of the relevant comments which have been selected on account of the significance to the research question. Note that the structure here is adapted to meet the coding categories as they develop from the data.

- Abstraction #7 – Council had strongly influenced the RFGM and the IRTP and a strong partnership with the state. It initiated the light rail project in that corridor to progress its land use planning objectives. x9 comments.
- Abstraction #8 – An integrated transport planning approach involves strategic thinking across a range of professional groups and objectives. x4 comments.
- Abstraction #9 – The collaborative culture comes out of the structure and the process, getting people into the same room, sharing information. Different views of professions, levels of government, community, and these different objectives are resolved through this collaboration. x12 comments.
- Abstraction #10 – In the pre-CDIMP phase Councils transport planning is driving the project in collaboration with land use planners. In the CDIMP the collaboration develops as land use opportunities become clearer, with planners and urban designers working with engineers and transport planners. x5 comments.
- Abstraction #11 – There are project tensions about transport versus land use and related professional tensions which can be positive but need to be dealt with within the context of an integrated planning outcome. x6 comments.

The discussion of the meanings in relation to the literature review and policy and project documentation evidence is conducted in Chapter Seven.

6.4 Mode and System Characteristics Enabling TOD

6.4.1. Introduction

The literature shows the way in which the mode and system characteristics (MASC) impact on land use outcomes and may or may not be enabling factors for TOD. It is evident that the land use objective can also shape the MASC. The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* This section addresses the third sub-question: *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?* The question is addressed according to the coding categories dealing with the level of confidence in light rail, the relationship between the mode and the idea of 'development oriented transit', the image of the mode, mode cost, flexibility, permanence, and transit corridor permeability as a TOD enabler, and the ability of the MASC to access the centre versus the urban edge.

6.4.2 1998 – 2008 The Answer is Light Rail

The advocacy for the light rail concept by Gold Coast City Council (GCCC) can be traced back to the planning aspirations of the Albert Shire Council who, in the mid-1990s, invited light rail and TOD experts, including Mr GB Arrington, from Portland, Oregon, to discuss the light rail potential to connect their growing region (Power 4.1). Following an amalgamation of councils in 1995 this idea is carried over into the new Gold Coast City Council.

Council's Director of Planning Environment and Transport, Warren Rowe, notes that from the beginning "... the answer was always light rail, and very early in the piece... whenever anyone asked, whatever the question was, it was always light rail" (Rowe 7.18) and it is evident that the issue of the light rail has served as a reference point for Council over many years since the amalgamation:

We have had this evolving discussion with the Councillors and there have been some seminal parts of that journey of discussion with them where they have actually been very brave, I mean the introduction of the transport levy. And it is interesting too that many of those seminal moments with the Councillors have also been about the light rail. I mean the light rail is that catalyst for investment or that catalyst for discussion... But the project itself, light rail, has been such a common thread around that discussion. (Rowe 7.4)

The first manager for transport planning and architect of the CTP, Ken Deutscher (1997/98), explains that the light rail concept had a practical and symbolic function, "... to send a message that things were going to be different it [1998 City Transport Plan] was launched always as a light rail project because transport planning knowledge was pretty clear that this was the appropriate mode" (Deutscher 3.2).

The second manager for transport planning, Rod Grose (1998-2010), establishes the project financial case and funding framework, through the transport levy, demonstrating Council's commitment to the project. Council's activism for the light rail can be contrasted with that of the state at that time, (note the success of the busway and failure of Brisbane light rail) where the light rail was being "pushed from the Gold Coast end and ignored at the Brisbane end" (Grose 1.14). It is evident from key Council people that there was a firm view against light rail within Queensland Transport (Baildon 5.14).

Council officers and councillors have preferred light rail over bus (Grose 1.22). Key Council officers and councillors progress the light rail concept at the state level even after the election of a mayor running on an anti-light rail platform in 2004 and again in 2008 and the pro-busway position of the state government:

We had a Mayor that was elected opposing light rail and he was re-elected still opposing light rail. On any vote that we took to Council we never got anything than 100 per cent support for whatever it was; the funding package, the route. Now there are a number of reasons for that as well but it shows what an administration that is actually energised and aligned can achieve. (Rowe: 7.11)

Former Gold Coast Mayor, Gary Baildon, a key political champion for the light rail project up to the end of his term in 2004 notes:

Let me say first that the Council adopted the plan without dissent, unanimously and every time it was put to Council it was carried unanimously, every time. (Baildon 5.2)

The state required a detailed evaluation of both BRT and LRT and these two options are evaluated as part of the Value for Money Framework which informs the Business Case. GCRT Communications Manager, Anna Carroll, notes the value of this process:

I thought there was so much debate. I thought there was really good data. I was really proud of how genuine the project, the work that Tim [Poole] led. It was very difficult because Council had an on the record preference for light rail and yet there

was a genuine evaluation and to get a good outcome, not to dress it up as a fait de compli. (Carroll 8:11)

Council's firm view in favour of light rail can be contrasted with the state support for busways. From the outset the idea of the light rail is tied to the idea of City Building, note the initial invitation to GB Arrington in the mid-1990s and his work on TOD and the idea of Development Oriented Transport. The significance of the light rail for Council is notable and their advocacy for light rail can be seen to be central to Council's wider planning objectives. In the end the mode debate is seen to have been rigorous and based on a genuine evaluation. The mode issue is resolved in 2008 and is followed by the Nation Building funding for the project with a focus on the City Building opportunities.

Table 6.8 The Answer is Light Rail – Abstracted Meaning

The answer is light rail

1. The light rail potential was recognised prior to council amalgamation [1995] and carried over into the new amalgamated council. (DP 4.1)
2. The answer was always light rail. The experience from observing LRT around the world confirms that. Not getting light rail meant something lesser, maybe significantly lesser. That intuition was put to the blow torch and found to be correct. (WR 7.18)
3. The light rail has been the catalyst and the common thread in the evolving discussion around the key investment issues and many of the seminal moments with councillors. (WR 7.4)
4. It was clear from a transport planning view that light rail was the appropriate mode for the corridor. In hindsight the decision was right; the busway would not have fit the corridor. (KD 3.2)
5. Gold Coast advocacy for light rail was at odds with Brisbane's position on the busways. Queensland Transport and Brisbane City Council's position on busways was about moving large numbers of people. (RG 1.14)
6. There was a firm belief that it should be light rail but there were different views in Queensland Transport. The appeal was the light rail vehicle capacity so that it took many cars off the road and the environmental benefits for the city. (GB 5.14)
7. Council officers and councillors have always preferred light rail over bus. (RG 1.22)
8. Administration aligned and energised so even though the mayor was elected and re-elected opposing the light rail the Council always gave 100 per cent support. (WR 7.11)
9. The CTP was a thirty year plan, and contained the light rail project. Council adopted the plan unanimously and it was carried unanimously every time it was put to Council. (GB 5.2, 5.3)
10. There was really good data, so much debate and a genuine evaluation. It was very difficult because Council had a preference for LRT. (AC 8.11)

AM12 – Since the mid-1990's onwards there was a firm view within Council in favour of light rail for the corridor; this was at odds with the state view in favour of busways. x10

6.4.3 The Mode and Development Oriented Transit

The CDIMP tends to deal with the mode as a transport issue with an acknowledgement of the TOD/land use opportunities but the commentary reflects a wider range of factors in the mode decision (Deutscher 3.15; Case 12.15). Council tied the light rail, from its conception to a bigger, wider 'City Building' vision for the city (Deutscher 3.9). Council's Planning, Environment and Transport Director, Warren Rowe, sees the light rail as a "Trojan Horse" for change; that it was always more than a transport project; that it was about realising a variety of policy objectives (Rowe 7.2) and it is this message that underpins the successful bid for the Infrastructure Australia funding from the federal government:

You don't do public transport just to get people from A to B, that is not the end, it is the means to an end, and the end is really to regenerate the city and all the land development opportunities, all the benefits that you get, that is why you build a project like the GCRT and that is why you build light rail because it has all these iconic features, people identify with it and it becomes part of the city.... (Boersma 9.6)

GCRT Project Director, Tim Poole, notes the way in which the mode characteristics came into play with the land use objective and the economic costs and benefits associated with the permanency of the system:

One of the benefits was the issue around the confidence of the permanency of the light rail and its ability to provide long term mass transit capacity was one of the things that would attract new businesses to an area and it would allow reliable planning around nodes and that was one of the qualitative factors that we had identified would have a strong value... We were trying to get away from economic costs and talk about economic benefits... even though it [LRT] was going to cost fifteen per cent more over the life of the project than bus, it had all these benefits that went beyond the transport system. (Poole 15.6)

GCRT Property Manager, Paul Grennan, notes how the issue of land value comes into the equation in an unprecedented way for a Queensland transit project:

...we had the only business case ever in Queensland that had consideration of residual land in the business case itself, normally you would have the overall land costs, what it cost us to buy the land, in our case we actually had the land costs less the residual land, so there was a net land cost. (Grennan 13.4)

The particular nature of the Gold Coast corridor was seen as "good territory to put the transit in" (Deutscher 3.10), the power of the beach as a real estate anchor is important (Bitzios 2.49) and there is already "heaps of development" (Grose 1.18). Sections such as

Southport are seen as sites for urban renewal and the light rail capacity for redevelopment in Southport is an important driver (Baildon 5.11). The faith in light rail as a catalyst for change in this environment is highlighted by the support of the development industry (Power 4.14). There is a clear and consistently articulated view that the transit design was oriented to the existing and future development; it can be seen to be a case for DOT rather than TOD.

The project can be seen to evolve in an unconventional way in response to its unique urban environment and the unusually strong planning and urban design values. However, this can also be seen as part of the problem with the community perception of the project and a view that outside the project space people were not understanding the higher level vision, that they were not 'getting it' (Bitzios 2.39; Brooke 2.40; Carroll 8.7; Chang 11.9; Molhoek 14.10). People did not understand the light rail because they had not seen it (Bitzios 2.39; Brooke 2.40), or they were suspicious of it as something foreign (Chang 11.9), or they were not looking to the future (Molhoek 14.4), or because they were uninformed about the problem (Carroll 8.7):

The population just do not understand what this is going to do. They might think that they do but they don't. I know that sounds arrogant but they have no understanding. This thing will arrive and it will fundamentally change not just that corridor but the way that other corridors and centres operate. I firmly believe that if you dig me up in twenty to thirty years' time, bring me back, I reckon you will see a vastly different city, not just in a physical form but in terms of how the community itself sees the city, not just in a movement sense. (Rowe 7.19)

Council come into the project with a clear vision that is oriented to the land use objective. This is a view that influences the project team, planners, engineers, and others involved in the planning and design of the project. Council's advocacy for the land use objectives becomes an evolving theme as the project develops and the land use objective is a key factor in the federal government funding.

Despite the firm views within Council about the merits of light rail and the wider benefits of the project for the city there is a perception that many in the community, including the state government, do not "get it" – that is, what the project is really about and that the GCRT is more than just a transport project.

Table 6.9 The Mode and Development Oriented Transit – Abstracted Meaning

The mode is the means to the end

1. Lifestyle, not the mode, is the primary decision. (KD 3.15)
2. Does not matter which mode as long as good legibility and access is provided. (BC 12.15)
3. GCRT was as much for transport as it was for the image of an attractive city, that vision probably got stronger as the project became established. The light rail fit that image. (KD 3.9)
4. LRT was more than a transport project; it was the Trojan horse that would fundamentally change the city. It was about a range of policy areas but it was the transport/land use relationship that was the pot of gold. (WR 7.2)
5. Public transport is the means to an end, and the end is really to regenerate the city and all the land development opportunities, that is why you build light rail. (AB 9.6)
6. Light rail was tied to economic opportunity and reliable planning, we were trying to get away from economic costs and talk about economic benefits. (Poole 15.6)
7. The business case considered residual land value so we had the land costs less the residual land, so there was a net land cost; that was a first. (Grennan 13.4)

AM13 – Mode was not the end but the means to the end. x7

Transit supporting development

1. Surfers Paradise Boulevard was good territory for the transit. It was a demonstration that things really were changing. (KD 3.10)
2. The beach, from Surfers to Broadbeach, is the real estate anchor, the high value area. That will always be the case with or without LRT. (DB 2.49)
3. TOD concept is normally a station waiting for development. Gold Coast has the development but not the transit. (RG 1.18)
4. We knew that there would be significant growth and development in the walk up area to the station. There was great opportunity for higher densities and increased business, especially in the mostly older developed areas and Southport. (GB 5.11)
5. The three big developers on the route were not immediately committed to light rail but they were passionate about rapid transit and understood the ramifications of it. Smaller developers were supportive but did not understand the intensity or the speed of change once it was operational. (DP 4.14)
6. LRT was more than a transport project; it was the Trojan horse that would fundamentally change the city. It was about a range of policy areas but it was the transport/land use relationship that was the pot of gold. (WR 7.2, 7.3)

AM14 – The transit supported existing development and would be a catalyst for new development in the corridor. x6

Getting it

1. Unless they had travelled it would be difficult for people to understand the place opportunities. (DB 2.39)
2. Unless you see it the majority of people will not know what it is. (SB 2.40)
3. There was disbelief and disinterest about the light rail, the community did not know they had a problem. The way the city was going was not sustainable; we would not have a bright future if we kept doing what we were doing. They were uninformed. (AC 8.7)

4. People were suspicious of something foreign, from somewhere else and did not believe that it would fit with the unique nature of the Gold Coast. It was difficult to convey what we were trying to achieve unless people had travelled and were educated about it. (MC 11.9)
5. People do not look far enough into the future. After three or four years' experience with travel and different cultures and relying on public transport you realise that you can never build enough roads; there is not enough space. (RM 14.4)
6. The population do not understand what this is about. This will fundamentally change the corridor and the way that other corridors and centres operate. In twenty to thirty years' time, the Gold Coast will be a vastly different city, not just the physical or the transport but in terms of the way that the community sees itself. (WR 7.19)

AM15 – Unless people had seen light rail elsewhere it was difficult for people to understand what the project actually was or why the Gold Coast needed it. x6

6.4.4 Image of the Mode

The higher level vision for the project, that is a vision of transit beyond a traditional transport function, poses a challenge for people 'getting it'. Many people in the city have not had a first-hand experience with a modern, European style light rail system. This gap in understanding becomes filled with either attractive, 'sexy' imagery showing LRT sitting elegantly in the urban environment or from the anti-light rail lobby, including the Gold Coast Mayor, Ron Clarke, who himself has negative images of older trams systems.



Lignes 1, 2 et future ligne 3 de Montpellier

Image 6.1 Montpellier Light Rail - Citadis Vehicles by Alstom

As the mode debate gained momentum Queensland Transport and then the bus lobby responded to the positive LRT imagery with high quality visuals of the BRT looking very similar to the LRT "almost building a light rail system with a motor and tyres" (Brooke 2.25), "in the imagery of the project they looked similar, the vehicles looked similar, the stations looked similar. The other day there was an article about the extensions of the light rail and the vehicle in it was the bus..." (Chang 11.11).

The imagery associated with the system is acknowledged as an important issue for the community and politically and is tied to the image of the city (Deutscher 3.9). Former GCCC Councillor, Rob Molhoek, notes the symbolism of the light rail and how this was an important issue for the city:

I felt that in accepting buses that was all we deserved as a city, we are not big enough or good enough to have a world class public transport service, a fixed service, something that might cost a bit of money. I felt that we were doing ourselves out of something that as a city we deserved and I also felt that it was part of our coming of age as a city, to have a fixed rail whether it was a fixed rail or a light rail and to have a robust public transport system. (Molhoek 14.16)

The light rail image is seen as fitting with a desirable image for the city and this resonates with politicians and in the community (Poole 15.10; Molhoek 14.15; Power 4: 16; Papageorgiou 6.30). The LRT image was tied to an inner urban aesthetic (Kozlowski 10.9). GCRT Communications Manager, Anna Carroll, notes how the light rail image was considered by the community:

That image issue, how strong is that? On the Gold Coast, very, particularly from the likes of the Chambers and the likes of those who want to grow a new image for the city and can see something as sophisticated as this type of technology... So when you say to people “what do you think it should look like?” the word that comes up is “sexy”, and so they have a real image association with it, very much. (Carroll 8.12)

Whilst light rail has a positive urban image the buses, which are seen as more of a solution for the outer suburban areas (Kozlowski 10.7, 10.9) and unsuitable as an inner urban solution, are seen as polluting (Grose 1.22) or as having a negative social stigma (Brooke 2.22; Carroll 8.12).

Opponents to the light rail emphasised the image of the older tram systems where trams share roads with cars and congest the road space (Power 4.6; Seymour Smith 16: 10).

Overall the image of the light rail resonates with the Gold Coast community and can be seen as a bridge in taking the community understanding of the project from a basic transport task to realise a bigger and better vision for the city, even if the project and the community have different understandings of what that actually is. The light rail image is seen as a good fit with the desirable image of the city, one supporting transport and the wider city building objectives for the city.

Table 6.10 Image of the Mode – Abstracted Meaning

Image is important
<ol style="list-style-type: none"> 1. The image of the European vehicles had a very powerful impact on selling the project. This later became an issue tied to the city's tourism image. (DP 4.16) 2. Mode image is significant, especially for business. Light rail tied to a new 'sexy' image for the city as opposed to the bus which is stigmatised by a view that only certain types or classes of people use it. (AC 8.12) 3. Council's vision for the project emerges from the CTP. GCRT was as much for transport as it was for the image of an attractive city, that vision probably got stronger as the project became established. The light rail fit that image. (KD 3.9) 4. Image is nice but it was more of an issue for the community and politically, not for the project team. (TP 15.10) 5. Bus and light rail vehicles and stations look very similar and are mistaken. (MC 11.11) 6. The perception of light rail was of the old trams in Melbourne or Brisbane. People did not realise what this was. We were looking at state of the art product in Portland, Germany and France. (DP 4.5, 4.6) 7. People saw congestion issues, the 'tiny clunky' vehicles, the overhead wires, the safety but they did not want trains in the first place. (LSS 16.10)
<p>AM16 – The LRT's positive image was important to the city and a selling point for the project. x7</p>
Unattractive bus/BRT image
<ol style="list-style-type: none"> 1. As the Business Case assessment of the mode progresses the BRT aligns visually to look like the LRT. It indicated the preference for the LRT image. (SB 2.25) 2. The bus image conflicts with the desired tourism image in Surfers and Broadbeach. (RM 14.15) 3. The bus does not fit with the image of the city. (RM 14.16) 4. Image contest of large numbers of low capacity, diesel exhaust buses in a segregated corridor versus the high capacity, quieter, cleaner 'friendly and attractive' light rail. (RG 1.22) 5. Buses function very well in the outer suburbs but light rail has the scale, the integration with pedestrian and the aesthetic appropriate for the central city areas. (MK 10.7, 10.9) 6. People see a social difference between bus and LRT, bus has social stigma associated with it. (SB 2.22) 7. Mode image is significant, especially for business. Light rail tied to a new 'sexy' image for the city as opposed to the bus which is stigmatised by a view that only certain types or classes of people use it. (AC 8.12)
<p>AM17 – The LRT is contrasted with the bus/BRT image which was not seen positively in terms of the desired urban image for the city. x7</p>

6.4.5 Mode Cost, Flexibility and Permanence in the Urban Environment

The issues of cost, flexibility and permanency are consistent themes in the debate and related to the land use outcomes. It is evident that the potential strength of bus/BRT as cheaper and flexible is viewed negatively in the context of Council's vision for urban change and City Building, "one of the advantages of the bus, also one of its key disadvantages, is in its flexibility" (Bitzios 2.29).

Council's Manager for Transport Planning, Rod Grose, points out the busways are also fixed infrastructure (Grose 1.15, 1.16) and in this comment he highlights the perception of the busways as flexible and impermanent. In contrast LRT is clearly seen as permanent and this is an important positive for the mode and more important [than image] providing certainty to developers (Poole 15.10; Chang 11.7). It is also seen as versatile and able to work well in pedestrian environments (Deutscher 3.3) but it is the permanency of light rail that is central to the land investment objective (Case 12.12; Molhoek 14.11; Power 4.15; Poole 15.10). The permanency of the light rail is related to unquantifiable benefits (Carroll 8.6). According to the GCRT Project Director, Tim Poole, it was the light rail permanency that underpinned the confidence about the business and land use planning benefits in the mode evaluation process:

The approach with the mode analysis was to look at the whole of life costs associated with each of the modes and then to look to see if the difference could be made up or compensated for by the other benefits that light rail could provide over BRT and one of the benefits was the confidence of the permanency of the light rail and its ability to provide long term mass transit capacity... that would attract new businesses to an area and it would allow reliable planning around nodes and that was one of the qualitative factors that we had identified would have a strong value. (Poole 15.6)

After the mode evaluation is complete the LRT and land use/economic development relationship develops as a key element in the GCRT funding submission to Infrastructure Australia:

So we got a mode decision in September '08... in December '08 we put in the IA [Infrastructure Australia] submission... and the IA submission forced us to understand the economic benefits, what was it doing, and that is when a lot of the dots came together and we were then able to start to push forward with the land use concepts. (Carroll 8.6)

The advocacy for the BRT as a cheaper and flexible transport alternative to the LRT can be seen as out of alignment with the objectives of Council, and later the federal government, to realise the project not only as a transport project but to also realise wider city building and urban transformation outcomes.

Table 6.11 Mode Cost, Flexibility and Permanence in the Urban Environment – Abstracted Meaning

Permanency versus flexibility	
1.	The flexibility of the bus is also one of its key disadvantages. (DP 2.29)
2.	The busways provide a cheaper solution than a railway to move large numbers of people. The route is fixed; they are not flexible, actually very rigid to the exclusion of pedestrian movement. (RG 1.15, 1.16.)
3.	The permanency is more important [than image], the certainty that developers need to develop around. (TP 15.10)
4.	People supporting the bus thought it was cheaper and it probably is as a short term transport solution. For the light rail supporters it was about the permanence of the rail and the strong message that it sends. (MC 11.7)
5.	LRT has the versatility to work in a range of environments with the speed and ability to run in a pedestrian mall environment and mixed traffic. (KD 3.3)
6.	Bus flexibility has benefits but light rail is accepted, safe, sexy, and efficient. (BC 12.1)
7.	Light rail provides certainty to development. (RM 14.11)
8.	Concern to have a permanency with the mode. (DP 4.15)
9.	The key issue was the unquantifiable benefits of light rail over the bus because of the permanency of the corridor. (AC 8.6)
10.	LRT cost difference is offset by the confidence of permanency and long term mass transit capacity attracting new business and allowing reliable planning. (TP 15.6)
AM18 – The permanency of light rail was viewed positively. Buses and busways are viewed as flexible and there may be transportation benefits but the flexibility was seen negatively from a land development perspective. x10	

6.4.6 Transit Corridor Permeability as a TOD Enabler

The issue of mode and its characteristics highlights the issue of vehicle frequency and speed, and the importance of time efficiency and reliability in the system can be a consequence of the system being open or closed. An open system allows any number of vehicles into the corridor whilst a closed system provides for a set number of scheduled vehicle movements. In the GCRT the BRT system was proposed to be closed however most BRT systems are open systems. This issue was touched on by Michael Chang, Damien Bitzios and Leon Seymour Smith, all civil engineers with the project.

A BRT system can be open any time to other buses which in some ways is good because you can service greater areas and in other ways it detracts from the purpose because of travel times because when you start introducing random vehicles into the system it puts all that reliability out the window, if you are not careful... You need to control as much as possible the number of vehicles in a given corridor and it's probably harder with buses. (Chang 11.12, 11.15)

A fully segregated system is associated with greater system capacity (Seymour Smith 16.10) and there are "far greater efficiencies" associated with the open bus system to the point that "it is very difficult to see how it would stack up as a closed system" (Bitzios 2.31).

The idea of a permeable transit system was embraced as one of the key objectives within the project from an early stage "... we had already got rid of the overhead monorail concept, we had got rid of any notion of tunnelling and got rid of the idea of creating any strong barriers" (Poole 15.11). This is consistent with the vision of a transit system running at grade in a dense and active urban environment (Deutscher 3.16; Seymour Smith 16.13) and that would provide access to the centre so that city building and land development objectives can be realised (Seymour Smith 16.14).

Looking at international case studies there are many light rail systems that run into dense urban centres but the project found it difficult to find BRT systems that achieved the same level of urban penetration (Chang 11.14). The Brisbane bus experience is an international best practice transit system but its efficiency is a consequence of its segregation and was considered unsuitable for the Gold Coast project (Poole 15.11). GCRT Engineering Design Leader, Leon Seymour Smith, noted the problems of segregating the system; instead the priority was "to support active modes and look at more sustainable travel patterns by integrating it at ground level" (Seymour Smith 16.18). Corridor permeability is also associated with the capacity to have other social and economic activities adjoining the system:

... the important thing is that station is permeable and the station itself is a public space... There are a few examples in Strasbourg and Amsterdam. I saw a tram station that was absolutely adjacent to a vegetable shop; the guy had the stalls outside and you stepped off the tram right into that shop and I thought oh my god this is fantastic... it is critical not to segregate and to make it a public space with active frontages and people congregating, sitting. (Kozlowski 10.17)

The importance of the transit integrating into and enhancing the social and economic life of the city ties into the European LRT imagery that was important in the community support for the project. The commentary shows the land use objective as an evolving theme through the course of the project with civil engineering objectives coming into alignment with this vision. The commitment to permeability supported city building and enhanced opportunities for complementary activities that can take place in close proximity to the system:

... a tram is on tracks and we know where it is going to go, you can walk within a metre of it and it is safe, whereas a bus is driven by a driver... the separations you need are greater and the little bit extra that you need makes a big difference. (Bitzios 2.24)

You could actually build right up to it to some degree, and still have that safe feeling and that is something that you need to have when you start to look at increased densities and land use around these systems. You are used to seeing the light rail systems running through malls, and having that shop front come right up to the system... where you just don't see that with buses. (Seymour Smith 16.13, 16.14)

The literature has previously dealt with the impact of the transit edge at length (note Section 2.2.3), yet the subject matter is barely if ever acknowledged in TOD policy. Within the project the commitment to the permeability of the system is tied to the level of access in the station precinct and to activities in the immediate area. This commitment transcends professional differences and can be seen to strengthen through the course of the project.

Table 6.12 Transit Corridor Permeability as a TOD enabler – Abstracted Meaning

Segregated transit issues

1. The BRT and LRT vehicles and stations are similar. The difference is permanency and whether the system is open or closed. BRT systems can be open to other buses, enabling a greater service area but a loss of travel time reliability. (MC 11.12)
2. The super buses are not able to integrate into the road network so you have a closed system. The open system has capacity issues so looking at a closed spine based system concept for the South-East Busway that allows a lot more capacity through the system. (LSS 16.10)
3. Closed BRT system is a tenuous concept as an open bus system means far greater efficiencies. It is very difficult to see how the project would stack up as a closed system. (DB 2.31, 2.32)
4. There had been a fairly strong preference away from an impermeable system. We had got rid of the idea of creating strong barriers; that was Council's influence. (TP 15.11)
5. A fully grade segregated mode might have ticked some boxes but would not have integrated into the urban environment. As soon as you segregate it, it is a second class system. (LSS 16.18)

6. The issue of segregation was a factor in the [PB Report] mode selection. The tram has certainty and safety for pedestrians, more so than a bus which requires a higher level of segregation. Perception is that light rail is more permeable than the bus. (DB 2.24)

AM19 – Segregated systems have some transport benefits but these are negatives for land use which were a factor in the LRT choice. x6

Permeability and the quality of place

1. Permeability adjusts for a mixed traffic environment but in the bush it does not matter. (KD 3.16)
2. Preference was for integration, the qualities of the light rail: quieter, and a sense of certainty and safety, and this fits with the increased density and urban activity. (LSS 16.13, 16.14)
3. Should there be a statement here? (MC 11.14)
4. Important that the station is permeable and a public space so you get the social outcomes, people using the space for meeting, congregating, reading the paper, there were no barriers. (MK 10.17)

AM20 – Light rail is closely associated with better integration, proximity to the centre and supporting place qualities. x4

6.4.7 Centre versus the Edge

A key objective for Council is to have transit penetrating into the urban core and the 'Main Street' environment, hence the need for a permeable and permanent mode. Urban Design Team Leader, Marek Kozlowski, notes the importance of the mode in this vision: "Trams are a mode that integrate much better than bus. You have heaps of good examples of trams in Europe, and they have very good integration with pedestrians, with the surrounding uses, you cannot picture that with a bus..." (Kozlowski 10.7).

The issue of mode penetration is related to the qualities of the light rail: fixed track, manoeuvrability and amenity (Grose 1.27). Penetration into the urban centre enables walkability, accessibility and lifestyle objectives (Brooke 2.36; Deutscher 3.15; Case 12.13) and the walkability also defines the development catchment (Baildon 5.11; Papageorgiou 6.19).

The issue of mode penetration into urban centres was a key design issue for the project but it is in Southport, the business hub for the Gold Coast, where the mode and route issues came to a point for the project and the community. GCRT Project Director, Tim Poole, highlights the significance of this decision and the relationship between the mode and route:

Our first real test of the design of the system, the integration with light rail, was making the tough decision about going through the centre of Southport rather than

on the edge and that is where we introduced the notion to the community that this is about taking people to where they want to go, and Council's planning in the heart of Southport around very dense land use, and this was a way of activating that. That is when, certainly within the project team and to a lesser extent within the community, we started to understand that this was being designed as part of the future of the city and then when it came to justifying why light rail instead of BRT it started to become easier. (Poole 15.7)

Whilst the commitment to light rail as a vehicle for land use change becomes very clear within the project at this stage, communicating this idea to the wider community runs up against a number of problems, not least a failure to grasp this concept, local vested interests and genuine concerns about impacts. The Southport Chamber of Commerce campaigned strongly for bus/BRT and they wanted the route to run around or even under the centre. Marek Kozlowski, who drafted the Southport Master Plan about that time notes "Some of them [Southport Chamber of Commerce] thought that transport is better at the back of the city, rather than the centre of the city... If it was a BRT maybe there could be an argument behind that but with a light rail it should go in the central part of the city" (Kozlowski 10.13). PET Director, Warren Rowe, asked if he could see BRT running down Scarborough Street, states:

I can, but it is the lesser by a long way to get the sort of land use outcomes. That is why, whatever the question, the answer was light rail. Why? Not for the people moving aspects, but what it meant to the city in terms of future redevelopment, development of the city. Again this was never about the transport, although that was originally important, it was always about the value add to the city long term and the buses would not cut it. ... *Would the route and stations be different with BRT?* Possibly, yes possibly... there would be significant design implications. (Rowe 7.20)

The determination to run into the 'Main Street' is also associated with appropriate access for passengers "It's about putting the transit where people want to be and where people want to use it. There is no sense putting a system that stops a ten or fifteen minute walk out of Southport, because people just will not walk the ten or fifteen minutes" (Gross 1.29).

The ability of the mode to penetrate into the urban centre and to enable stations in the 'Main Street' environment was a key mode issue albeit one that was not immediately apparent to the project team. It could be seen as a key lesson that leads the design team to appreciate the significant advantages of the light rail in the urban environment.

Table 6.13 Centre Versus the Edge – Abstracted Meaning

Centre versus the edge
<ol style="list-style-type: none"> 1. Buses function very well in the outer suburbs but light rail has the scale, the integration with pedestrian and the aesthetic appropriate for the central city areas. (MK 10.7, 10.9) 2. To maximise the benefits of the system you need a vehicle that can penetrate the dense part of the city that is manoeuvrable, accessible and acceptable in the city. (RG 1.27) 3. It is about the place, not the mode; you could have a different mode. The place matters and you don't want to take the car to those places. The light rail system is 'the icing on the cake', in that it fits in so well into those environments. (KD 3.15) 4. The Brisbane Busway has a similar problem to the [Gold Coast] heavy rail as it does not have a walkable catchment and favours driving. (BC 12.13) 5. We knew that there would be significant growth and development in the walk up area to the station. There was great opportunity for higher densities and increased business, especially in the mostly older developed areas and Southport. (GB 5.11) 6. The Local Area Planning focus was on walk up area to stations, maximising the catchment, having the transit through the middle of the urban environment. (MP 6.19) 7. The first real design test was whether to go through the centre or the edge of Southport. That is where we introduced the notion to the community that is about taking the people to where they want to go and the activation of land use. (TP 15.7) 8. Southport wanted transit out of the centre. If it was BRT there is an argument for that but with light rail it should go in the centre of the city. (MK 10.13) 9. Could have had BRT running down Scarborough Street but a lesser outcome by a long way to get the land use outcomes there. It is about value add and the buses would not cut it. (WR 7.20) 10. No point in putting the transit ten or fifteen minutes away from where people want to use it. (RG 1.29)
<p>AM21 – The transit objective was to access the centre and ensure the quality of station place so the mode needs urban penetration and LRT achieves that. x10</p>

6.4.8 Abstraction of the Condensed Commentary

This section provides an overview of commentary from the interview material in relation to the third research question: *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?*

Council initiated the light rail project vision, viewing the project as a catalyst to activate economic and land development in the corridor and to enhance the urban and pedestrian environment, although this idea is not well articulated until the 2004 Feasibility Study. The TOD objective evolved and shaped the project over time. The key MASC identified by interviewees in relation to LRT were permanency and permeability which were seen as enabling for city building and TOD. BRT is seen as more mobility focussed, possibly cheaper and more flexible but is not considered to be an enabler for integrated land use and TOD.

The MASC differences come to the surface in the debate about the RASL; RASL in the centre or edge, or in the case of Southport, between Scarborough Street and Marine Parade.

The following list provides the abstracted meaning from the interviews which are dealt with in the next section. Appendix G provides the detail of the relevant comments which have been selected on account of the significance to the research question.

- Abstraction #12 – Since the mid-1990's onwards there was a firm view within Council in favour of light rail for the corridor; this was at odds with the state view in favour of busways. x10
- Abstraction #13 – Mode is not the end but the means to the end. x7
- Abstraction #14 – The transit supported existing development and would be a catalyst for new development in the corridor. x6
- Abstraction #15 – Unless people had seen light rail elsewhere it was difficult for people to understand what the project actually was or why we needed it. x6
- Abstraction #16 – The LRT's positive image was important to the city and a selling point for the project. x7
- Abstraction #17 – The LRT is contrasted with the bus/BRT image which is not seen positively in terms of the desired urban image for the city. x7
- Abstraction #18 – Light rail is permanent and this is viewed positively. Buses and busways can be flexible and there may be transportation benefits but generally the flexibility is seen negatively. x10
- Abstraction #19 – Segregated systems have some transport benefits but some negatives for land use which were a factor in the LRT choice. x6
- Abstraction #20 – Light rail is closely associated with better integration, proximity to the centre and supporting place qualities. x4
- Abstraction #21 – The transit objective is to access the centre and ensure the quality of station place so the mode needs to penetrate the walkable centre and LRT does that better. x10

The discussion of the meanings in relation to the literature review and policy and project documentation evidence is conducted in Chapter Seven.

6.5 Route and Station Locations Enabling TOD

6.5.1 Introduction to Route and Station Location

The literature shows a strong relationship between the route and station location/s (RASL) and land use outcomes. The transit on the edge can enable park and ride while the transit in the centre can enable TOD outcomes. It is evident that the RASL can be a product of the MASC which may or may not enable penetration to the urban centre. The RASL, like the MASC, can also be seen as being shaped by the land use objective. The main research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* This section addresses the fourth sub-question: *How is the Route and Station Location shaped by Transit Oriented Development objectives?* The interview data in this section addresses this question in relation to the coding categories dealing with the idea that the RASL is obvious, the RASL impact on centres and the way in which land development can drive the RASL decisions.

6.5.2 Deciding the RASL – “It is obvious!”

The reports on the feasibility of the light rail project show a variety of route options between Southport and Broadbeach, all running through the narrow Surfers Paradise precinct between the Nerang River and the Pacific Ocean. There are a number of potential north/south transit corridors in Surfers Paradise and other route options in Southport and Broadbeach but for several of the interviewees the corridor was ‘obvious’:

We have had a corridor with the beach on one side, so there is a natural barrier to movement and a river on the other, and flood plains, there has been a fairly small corridor for development... (Grose 1.7)

It’s pretty damn obvious that one isn’t it; that it should go somewhere down the coast. (Deutscher 3.23)

We were going through to where people need to be. We are going to take a transport system through a city because that is where the activity is. (Carroll 8.1)

In a way part of the corridor [Surfers Paradise] was a no brainer. (Brooke 2.11)

When we are identifying where the route should go, it was more about it is already there so how can we get stations closer to the centre of the action. (Bitzios 2.12)

For others in the project the RASL was less obvious, and this seems to reflect where people are focussed in the corridor. The significant debate about RASL in the Southport CBD highlighted deeply held views within the project and the community. The Southport business community and the Chamber of Commerce, concerned about the construction impacts, campaigned strongly for the 'out of sight, out of mind' Marine Parade option:

One was about going through the main street where you have all the activity in the CBD and the development potential versus going on the edge, along Marine Parade which was much more convenient from a footprint perspective but it was also travelling outside that retail precinct. They had their own merit, one was cheaper to build... the design at that point was something that made it more painful for the community... much more in the heart of the CBD... *Was that an easy decision?* No, no, it was quite heated and to some extent the station locations drove this alignment because of the perceived development potential at both ends of that street. (Chang 11.16, 11.17)

The debate over the route and station locations highlighted the competing objectives of transport planners and land use planners as well as divisions within the community about where the route and stations should go (Power 4.16; Kozlowski 10.12). Some of these divisions can be connected back to a short term view of retailers versus the longer term view of developers. Some of the frustration is also about why a station is located near one location or another and the issues that come into play around the location of stations:

There was significant pressure to put a station at Australia Fair, and it makes sense to me and I cannot understand why... I know that the idea is to put them at 800 metre lengths but that is not necessarily convenient. (Baildon 5.12)

Some existing constraints have been in play, a good example has been not getting the station outside Australia Fair. There were other things that constrained that... That would have been the best place to have a station, right in the centre of Southport but traffic movements and bus movements prevented that from happening... (Poole 15.13)

There are competing views about the 'right' RASL decision or the 'right' objective and there are professional differences; what is logical at an engineering level may not be a good City Building or land development outcome:

There was no thought as to the micro level, to the City Building outcomes, so if it made sense as an engineering solution, in terms of the radius of the track or the ease of the public utility plan or elevations to do it in a certain way, then that was the only reason that it looked the way that it did. (Grennan 13.7)

The commentary highlighted a range of values and objectives in relation to deciding the RASL in the Southport CBD and these were often in tension. In the end the Scarborough Street option was selected and this was driven substantially by the desire for 'Main Street' station locations, supporting the potential for urban renewal in the centre.

Another area where there are strong views about the land use objectives was in relation to the future stage options. The high level of interest and confidence in future stages of the GCRT was consistent across the interviewees. Future RASL preferences varied: to go north, south or west. The comments support the contention that the system should expand and that the success of stage one was important to this expansion:

I think the success of this project will allow it to expand, to start creeping out through the network and people will start getting used to the concept... (Seymour Smith 16.21)

I don't think that many people get that this is Stage 1, and I often try to point people to the fact that if you look at the plans there is a stage 2, 3, 4, 5, 6, and stage 7 which will eventually create this fantastic grid system. (Molhoek 14.18)

Extensions did not have to be light rail; many acknowledge the particular transport benefits of Bus Rapid Transit, and this was especially relevant for the east/west corridors. The future stage discussion is concerned to realise a bigger picture, an integrated transport network (Poole 15.22; Molhoek 14.12).

Potential development and land use change was a factor for and against future stages. The decision not to connect to the heavy rail in stage one was related to the lack of density in that corridor (Power 4.22). There was a concern that an expanded system be related to improved land use outcomes (Brooke 2.13; Carroll 8.15; Kozlowski 10.20).

There was also concern to recognise the long time frame to realise urban transformation:

It's a transformational thing for the city ... No other city has tried to build a whole system in one go, they all start with one bit and gradually expand and extend, that's been the history of anywhere it has happened. (Grose 1:40)

Well I think it is something that developed over the years. If you look at those trams in Europe, a city like Amsterdam, this is years, decades of transformation, I mean the trams were introduced late nineteenth century, twentieth century, so that is part of the evolution of the city. (Kozlowski 10.6)

People also need to understand... public transport systems don't develop like that they take generations... The transport system has to grow as we grow, so this first system is a bit of a beach head. (Molhoek 14.18)

The RASL in stage one and for future stages highlighted the importance of the land use objectives in the project design. It is evident that there are differing views about the RASL, what is obvious and what is not and this extends to the objective around the future stages although there is a general agreement around the need to activate land use and the need to expand the system over time.

Table 6.14 Deciding the RASL – Abstracted Meaning

<p>The RASL is obvious</p> <ol style="list-style-type: none"> 1. Gold Coast has an urban form that provides a natural barrier to movement and a fairly small corridor for development. It also has a welcoming attitude to development and that is where the density has been. (RG 1.7) 2. The corridor was obvious. (SB 2.11) 3. The route was already there so it was about getting the stations closer to the centre of action, not generating more. (DB 2.12) 4. It is pretty obvious that it should go somewhere down the coast. (KD 3.23) 5. We were going to where people need to be, where the activity is. We did not do it around the land at the time. (AC 8.1)
<p>AM22 – The Gold Coast urban form provided a small corridor for development and this is where the development, the density and the activity was. It is obvious that the route was there so then it was a matter of connecting up the dots. x5</p>
<p>The RASL is not obvious</p> <ol style="list-style-type: none"> 1. Southport RASL had two contested options: one was convenient, cheaper and on the edge, the other connecting to the activity and development potential in the heart of the CBD. The decision was heated. The station locations drove the alignment. (MC 11.16, 11.17) 2. Some people [developers] understood the effect that the light rail would have on their product and wanted stations right near them but in Southport some people, a minority, did not. (DP 4.16) 3. There was a lot of debate in Southport. A large percentage of them preferred the LRT out of sight, out of mind, underground or wherever, along Smith Street or along Marine Parade. (MK 10.12) 4. There was significant pressure to put the station at Australia Fair. That made sense and I could not understand why that did not happen. (GB 5.12) 5. Existing constraints such as traffic movements have constrained some station location decisions such as a station outside Australia Fair. (TP 15.13) 6. The project was not focussed on the micro level/city building outcomes, land value opportunities did impact on design decisions. (PG 13.7)
<p>AM23 – The RASL was not obvious, at least not in Southport where there was a heated debate about whether to put the light rail out of sight out of mind on Marine Parade, on the edge, or in Scarborough Street, the Main Street of the CBD. x6</p>

Land use to drive future stages

1. A lack of density and mass in the corridor would have diminished the project. (DP 4.22)
2. Without the extensions being tied to new development, the systems may struggle. (SB 2.13)
3. The route options in Surfers Paradise were supported by the realisation of activated streets and active, walk up catchments and associated development opportunities. (AC 8.15)
4. The light rail will change the city. In the beginning you have tourists and students. The public will eventually adjust. It is also important to have the east/west links. (MK 10.20)

AM24 – The light rail future extensions were likely to be driven by land use change. x4

Staged development of RASL

1. The land use fundamentals are right so that it can expand on the Gold Coast. People will get used to it. It will be successful and it will influence other places to do light rail. (LSS 16.21)
2. Light rail systems are built in stages, they all start with one bit and gradually expand and extend and that has been the history of light rail everywhere. (RG 1.40)
3. The European experience shows many decades of corridor transformation and evolution. (MK 10.6)
4. Public transport systems, such as in Hong Kong, take generations to develop and they have to grow with the city, so as the city grows so too will the transit system. (RM 14.18)
5. The light rail will connect to the heavy rail, somewhere. It will go to Burleigh. (TP 15.22)
6. Frustration that it did not connect to the heavy rail as this may affect the patronage as people are reluctant to transfer. (RM 14.12)

AM25 – The international experience shows how these systems would take a long time to develop. x6

6.5.3 The RASL Impact on Centres

One of the qualities attributed to light rail is its ability to penetrate into the urban centre and in doing this to then activate opportunities in the centre. Whilst this seems to be attractive and according with a TOD objective there are significant short term costs, risks and impacts on the community and on the project. From a transport planning perspective these may be seen as undesirable impacts on the community, on the budget and on the transport functionality of the system. The longer term impacts also have political impacts. So there was a need to justify these greater impacts.

Alternatively, the RASL to the centre was justified on accessibility grounds and there is a view that the urban transit system should take people to where they want to go (Poole 15.3; Gross 1.29) and to realise the commercial benefits for traders in terms of the higher visibility that comes from being on the route (Chang 11.19).

The Southport RASL experience is compared to the Brisbane Light Rail Project which had failed just a few years earlier. Damien Bitzios, Project Manager for Brisbane Light Rail before drafting the 2004 PB Feasibility Report notes “It was a similar issue, going through an established area, it was magnified because it was far more mature and a lot more congestion, kerb side usage issues than there are on the Gold Coast” (Bitzios 2.16).

In Southport and in Brisbane the main concern is in relation to the loss of car parking, “those impacts, the loss of parking, is the single most important thing” (Brookes 2.18). The Gold Coast is a car oriented city and the value of car parking is deeply entrenched in the psyche of small local retailers and arouses considerable emotion (Power 4.13). The two main streets in the Southport CBD that provide the RASL also provide some 400 highly visible and convenient on street centre park spaces which would be lost. Parking was related to the success or failure of small business in the CBD. GCRT Property Manager, Paul Grennan, notes the “extremely intense” feelings of traders in an already challenging economic time:

It is a thing that we have to deal with daily; it cannot be resolved by us saying that light rail is going to be good in the future... these people are not looking two years into the future. We are in a very difficult financial time; we have twenty-five per cent vacancies in commercial properties in Southport. (Grennan 13.12)

The challenge for the project was to realise the desired accessibility benefits with the longer term TOD benefits albeit at the cost of significant, negative short term impacts and the perception of dire consequences for traders on the corridor including the longer term consequences related to the loss of parking. The BRT on the Marine Parade edge is seen by traders as more suitable with lower impacts and easy parking.

Table 6.15 RASL Impact on Centres – Abstracted Meaning

- | |
|---|
| <ol style="list-style-type: none"> 1. We agreed to put the station at the southern end of Southport now as it would be a catalyst for land use change. (TP15.3) 2. No point in putting the transit ten or fifteen minutes away from where people want to use it. (RG 1.29) 3. There was an opportunity to realise the commercial benefits for traders in terms of the higher visibility that comes from being on the Main Street route. (MC 11.9) 4. Brisbane light rail had similar issues with running in a mature area. The trader perception is negative, especially in relation to parking. (DB 2.16) 5. Southport was strongly against it. The retailers were focussed on making a living today and on the parking, not five years into the future. (SB 2.18) 6. Retailers focussed on the shop and the customers and there are people who will go |
|---|

broke during the construction period. The developers have a longer term view of the land use, they see what it will be rather than what it is now. (DP 4.13)

7. RASL has impacts on local traders who have short term concerns where developers can take a longer term view of the project. (PG 13.12)

AM26 - The RASL requires choices; either the high impact, high cost, high risk, high access route or the low cost, low risk, low impact, low access route. x7

6.5.4 Land Development Driving RASL

The development objective was a central element in the evaluation of the RASL options detailed in the 2004 PB Feasibility Study and was also evident in the CDIMP documentation. The extent to which land development was an evolving and ultimately significant driver for the RASL was clear in the commentary. It can be seen that there were a number of drivers behind this thinking and a number of different ways of understanding the land use impacts.

It was the opportunity for future planning and development which influenced Council's commitment to the project (Baildon 5.11) including the RASL decision (Papageorgiou 6.18).

In terms of the design of the corridor the development opportunities were obvious:

It was already staring you in the face, they were already there it was really a matter of most appropriately, most efficiently connecting up those dots. (Bitzios 2.15)

For others the land use driver took longer to become apparent and this is evident in the GCRT project team space where the awareness of land use was seen as "more of an evolutionary thing rather than something that was recognised immediately" (Power 4.10).

The support for the light rail and its benefits by Gold Coast development was noted and this is tied to their recognition of the longer term land opportunities (Brooke 2.20; Power 4.13) and this was also evident in their commercial behaviour (Grennan 13.12). The land development driver shaping the light rail RASL was contrasted with the experience of other countries:

... look at the French. They are putting in a tram... They would not think of doing the light rail project without redeveloping along it. Their cities are older than ours, but that is how they would decide their routes. In some ways, where are people moving? Where do they want to move? It is probably going to end up in the middle of town because most cities are that shape, and so the routes they are going to take are the ones with the best business and potential for regeneration. (Deutscher 3.35, 3.36)

Consistent with the view of an evolving land use/TOD objective in the CDIMP process and the detailed RASL planning the land development objectives come to the forefront, “if we take the route first, the greatest driver for the route is the future plans for the city... I think the land use has generally driven station locations...” (Poole 15.3).

In the course of the CDIMP, as development issues evolve, the actual land impacts become clearer. The project was required to fully or partly acquire about 250 sites, such as the sixty-five unit Swan Lane apartment building in Southport which was completely demolished. These acquisitions were initially seen as a cost and risk to the project and in time the thinking around this also develops. Michael Chang recounts the project experience in the Southport RASL planning:

... in the first moments of the discussion it was ‘oh my god’, massive impacts, that is what people will see, that is a massive impact decision. Then we started to think about, okay, we have available land that can be amalgamated, could be part of the renewal of that precinct and we could do all sorts of things with the development industry, get some traction around that as well. It was probably one of the tipping points to put a focus back on the land around the station. (Chang 11.20)

Stations are often located at intersections to provide cross street access which involved the flaring of the road corridor at that point with significant land impacts at the intersection. In the longer term this also provides significant sites that could be consolidated and redeveloped and this was a reason for the Scarborough Street RASL option with the station at the southern end of that street (Power 4.20).

Beyond the land development objective was the desire to realise a high quality transit environment with better streets and public realm outcomes and this was evident in a route change that was achieved after the Indy motor race track was reduced to accommodate a V8 motor race. This track change enabled a review of the route so that the rail would run down the pedestrianised Surfers Paradise Boulevard instead of the busy Ferny Avenue/Gold Coast Highway corridor. Michael Chang explains the driver for this route change:

Yes... they were forced to rethink the [Indy] circuit and that opened up the big opportunity to relook at the route... By that time we were starting to talk about City Building in the project... Ferny Ave is so constrained by the volume of traffic that it carries that its potential was pretty low. There was development potential in the area, big vacant lots, but the street environment is not appropriate for changing the

character of that place, making it more permeable, really transforming the road reserve. This is one of those key alignment decisions that could possible transform that part of Surfers. (Chang 11.21)

The RASL was shaped by the land development potential of the corridor but there were wider, 'softer', placemaking, streetscaping benefits influencing the RASL decision and this was related to the success of the project.

There are also revenue and business case drivers and these are critical and underpin any of the land development decisions. The future land development and better land use could be related to improved patronage and revenue in the longer term (Seymour Smith 16.16). The improved land use and value was also tied to the potential to finance future stages:

We only look at patronage to support light rail and there are other ways to generate the funding needed to get light rail out of the starting blocks, the lack of acknowledgement that light rail leads to an increase in land values...(Grennan 13.17)

The land development objectives of the State and the Council were acknowledged in the formal evaluation objectives for the RASL options albeit not well developed but they did drive the high level thinking and the planning of the key RASL decisions within the project.

The land development driver was an evolving theme which may have not been fully realised until after key transport planning objectives were dealt with. From the project director down there was a clear vision and commitment to future land use as a driver for the RASL although the approaches to the land development objective varied from strategic long term city building visions and related future patronage projections to shorter term residual land development opportunities around stations and improving the quality of the public realm.

The findings here generally support the literature and reflect the policy intent but they go much further in that they show land development not as one factor but as the significant driver in the RASL planning.

Table 6.16 Land Development Driving RASL – Abstracted Meaning

RASL driven by development opportunities

1. It was probably seven to eight years ago that we realised the increased scale and intensity of light rail and the change to form and function. That has been an evolutionary thing rather than something that was recognised immediately. (DP 4.10)
2. We knew that there would be development in the walk up area to the light rail. There was great opportunity for high densities and new business and enthusiasm about the

- impact on mostly older developed areas such as Southport. (GB 5.11)
3. The regional planning framework objective of integrated transport and land use was met by the light rail running in Broadbeach, Surfers Paradise and Southport with the alignment of the density, with amenity which was the beach. (MP 6.18)
 4. The solution was obvious, it was already there. It was really a matter of connecting up those dots. (DB 2.15)
 5. Developers believed that the light rail would benefit their development sites. (SB 2.20)
 6. Retailers were focussed on the shop and the customers and there are people who will go broke during the construction period. The developers have a longer term view of the land use; they see what it will be rather than what it is now. (DP 4.13)
 7. RASL has impacts on local traders who have short term concerns where developers can take a longer term view of the project. (PG 13.12)
 8. French light rail route planning is focussed significantly on the opportunities for urban regeneration and redevelopment with penetration into the centre. (KD 3.35, 3.36)
 9. Land use, concentration of use, accessibility, connectivity and activity now and in the future is driving the station locations. We agreed to put the station at the southern end of Southport now as it would be a catalyst for land use change. (TP15.3)
 10. There was an initial 'oh my god' moment, massive impacts [in Scarborough Street], followed by realisation of the land development and renewal opportunities. (MC 11.20)
 11. Maximising the land use activation and revitalisation objective drove the Southport RASL. (DP 4.20)
 12. The opportunity to rethink the alignment focussed on the improved street environment and the character of the place and to transform that part of Surfers. (MC 11.21)
 13. The corridor has been selected for its land use change potential and that land use change has to be realised for the system to achieve its transport goals. (LSS 16.16)
 14. The mode and corridor decision was not focussed on the micro level/city building outcomes, but the land value opportunities did impact on design decisions. (PG 13.7)

AM27 – The development opportunities drove the RASL but this also increased the level of impact in the centre. x14

6.5.5 Abstraction of the Condensed Commentary

This section provides an overview of commentary from the interview material in relation to the fourth research question: *How is the Route and Station Location shaped by Transit Oriented Development Objectives?*

The RASL was seen as obvious and in sections much of the available corridor is highly constrained. The RASL was not obvious in Southport and for some it was not immediately obvious in Surfers Paradise. The decision to run light rail in the 'main street' corridors posed a higher risk for the project. There were expected impacts on some traders and a loss of on street parking. The evolving TOD and City Building objectives shifted the focus from the short term impacts to consider the potential longer term benefits in the centre. Finally, the

RASL decision making process can be seen as reflecting the evolving values and beliefs about the project. These values were also evident in the future stages commentary. It was evident that the RASL was, at least in the dense urban areas, substantially a consequence of the TOD objectives.

References to other SEQ transit projects in relation to RASL and the MASC highlights differing values about the transit/land use costs and the benefits and the underlying tension between mobility and city building objectives.

The following list provides the condensed narrative from the interviews and provides an abstracted meaning; these are dealt with later in the next section. Appendix G provides the detail of the relevant comments which have been selected on account of the significance to the research question.

- Abstraction #22 – The Gold Coast urban form provides a small corridor for development and this is where the development, the density and the activity is. It is obvious that the route was there so then it was a matter of connecting up the dots.
- Abstraction #23 – The RASL is not obvious, at least not in Southport where there was a heated debate about whether to put the light rail out of sight out of mind on Marine Parade, on the edge or in Scarborough Street, the Main Street of the CBD.
- Abstraction #24 – The light rail future extensions are likely to be driven by land use change.
- Abstraction #25 – The international experience shows that these systems take a long time to develop and that a future stage should connect to the heavy rail.
- Abstraction #26 – The RASL requires choices, either the high impact, high cost, high risk, high access route or the low cost, low risk, low impact, low access route.
- Abstraction #27 – The development opportunities drove the RASL but this also increased the level of impact in the centre.

The discussion of the meanings in relation to the literature review and policy and project documentation evidence is conducted in Chapter Seven.

6.6 Is GCRT a Transport or a Land Use Project?

6.6.1 Introduction

The conception of the project within Gold Coast City Council was driven by a view to realising integrated land use and TOD outcomes in the corridor as detailed in the 2004 light rail feasibility study. The Concept Design and Impact Management Plan (CDIMP) documents portray the light rail primarily as a transport project but it can be seen that in the course of the project design that the GCRT team focus is increasingly oriented strongly towards the realisation of City Building and TOD objectives.

The projects structures and processes involving different levels of government and different professional groups are related to the integrated and collaborative team environment and this underpins the integrated planning and design outcomes. Consequently, the MASC and RASL, as the key land use enabling factors, are focussed on realising the TOD objective.

The main research question asks: *How do TOD objectives influence the transport planning process and outcomes?* This section addresses this question through a final question to the interviewees: *Is GCRT a Transport or a Land Use Project?* The responses highlight both how and why the land use and TOD objective influenced the GCRT project.

6.6.2 Transitioning from a Transport Focus to Land Use

The interview responses to the final question vary but there is a strong view that the initial focus was on the transport objective but over time it became increasingly focussed on land use, City Building and the land development/TOD opportunities. There tends to be a stronger focus on the transport objective by those involved in the earliest days of the light rail conception, such as the Mayor through to 2004, Gary Baildon, who believed that the project had been led predominantly by transport objectives (Baildon 5.18) and the then Manager of Transport Planning for Council, Ken Deutscher:

Very clearly the project emerged from the transport planning area and it had a strong focus, not on city building, that was part of it, but a strong focus on the mass transit task, on more sustainable ways of moving people... (Deutscher 3.8).

The second Manager of Transport Planning, Rod Grose, and the GCRT Lead Engineer Designer, Leon Seymour Smith, highlighted the significance of the patronage objectives and there are connections here back into the way in which the urban environment supports this:

It is all about bums on seats, the fact that there is a population and a user group there ready to use this thing so that from day one there would be people riding on it, and hopefully lots of them, rather than building something with the hope that development and passengers might come in the future. (Grose 1.35)

It was all just bums on seats, and to some degree it still is, I mean if you go to Treasury they are interested in what it is going to cost and what they are going to get back, not necessarily the knock on benefits. (Seymour Smith 16.5)

The second issue in relation to realising the transport objective is the need to address traffic congestion:

Probably what was the focus of our attention was that we knew that the centres Southport, Surfers and Broadbeach would hit gridlock at some stage, and so for probably five years that was the driving force for the project rather than changing the land use patterns. (Power 4.10)

The transport drivers here were focussed on the need to sustainably move people through a rapidly growing city that was faced with the challenges of gridlock congestion. For the State Treasury there is the need to ensure a patronage base that will ensure immediate revenue for the project. There is a balance between short term transport and financial objectives and in the background to this there was a longer term land use objective. There were also views that see the light rail well beyond these traditional transport concerns:

Well I hope it is an urban design project, creating places in the city and very good urban design outcomes that is what we always hoped this project would deliver and apart from that it will help people to move from one place to another... *When you were doing the... consultation were people talking about a transport project a land use project, or an urban design project?* Definitely about a transport project.... *Do you think that people have a conception of something beyond that?* ... No, no they don't, they don't see what the benefits are that it brings. (Kozlowski 10.18, 10.19)

For many in the project the looming transport congestion in the city is at the forefront of the justification for the project although the bigger project vision has a land use objective woven

into it reflecting Council's planning policy objectives. The commentary confirms the significant transport objective and an evolving land use objective:

Until about three years ago, I think it was led by transport objectives... I am not suggesting that the land use objectives or outcomes were not recognised but the driver was transport. (Power 4.16)

From my perspective it was essentially a transport planning exercise, because that was my background, and through the project I came to terms with the land use as well... In terms of other people I think it is definitely an eye opener on the land use benefits... In the community, I think there is... a shift in relation to the city's future... (Chang 11.4, 11.5)

I think it started off as primarily a transport project. As we started to get to the key decisions it started to become... all of a sudden it started to become more of a planning project and more recently the economics of it all and the ongoing benefits to the economy and to the city image starts to play a more important role. (Case 12.18)

Well, subject to my previous comments, the land use already being in place. I think that this is about choice of the route... I think it is fifty/fifty because the business was there, the opportunities to move people, the congestion of the city. (Deutscher 3.37)

The interviewees highlight the evolving land use objective which is initially a background issue and not clearly articulated nor apparent within the project planning. At some stage in the project there are detailed RASL choices to be made and this seems to focus the project onto the integrated land use/TOD possibilities. As discussed there are critical events such as the Southport CBD debate and the federal government's Nation Building/Infrastructure Australia contribution which was substantially tied to the City Building objective.

While the light rail was seen by many as a transport project, with or without an evolving land use objective, there are others who see the project clearly as a driver for land use change and TOD in the corridor, particularly those on the Council side who had shaped the early concept design. Even this view acknowledged that transport was the stronger and more legible message to justify the project to some in Council and the wider community:

In the beginning the project was always about more than just the transport, the public transport aspects, always... So for those who were involved in the project, we

had to sell it as a transport project because that is what people knew and that was appropriate because that's one of the biggest risks to the city. (Rowe 7.22)

To some extent the transport objective was accepted as a vehicle to realise the longer term planning vision for the city. It was major transport infrastructure but it would enable sustainable growth, City Building and TOD outcomes and in that sense it was more than just another transport project for those initiating the project:

It was certainly an integrated transport project... it was never just a light rail line, as a sort of vanity piece for the Gold Coast. It was a suitable form of infrastructure that could then form a network with other infrastructure... and it shared common objectives around managing growth and promoting density and mixed use with the land use planning framework. (Papageorgiou 6.28)

I certainly see it as a land use project, and we have said it before, it comes down to city building, really ensures that the city will continue to grow. People have got to move around... we are encouraging increased densities within these corridors but we have still got to get them to their schools and everything else, so it's critical on that side that there is a good balance there. I think the corridor has been partially, probably a lot, selected because of that land use element. (Brooke 2.46)

My personal point of view is that it certainly is a city building project. It certainly will change the way the Gold Coast, our residents think about the Gold Coast. (Bitzios 2.47)

The commencement of CDIMP with the project going from Council to the state highlights a shift in project focus from land use to transport but later in the CDIMP there is the shift from the transport objective back to land use and this is not explained by any one event. As discussed previously this was seen as an evolving process related to a number of events and seemingly after the core of the transport issues had been dealt with:

When we moved through the CDIMP itself it took a long time for the TOD element to start coming on, to start looking at how property uplift and property value capture really only came into the project about two years into the CDIMP... so that has come onto the project and it started evolving probably, almost after the project got the green light from the Feds, so it was not until then that we started to see some of the TOD principles applied until then in the greater sense. (Seymour Smith 16.3)

To what extent have we moved from a transport project onto something else?
Enormously, and that is because we have landed the transit solution... We understand that we can now comfortably put that to rest because we answered

that... Because we made really good decisions about that it has opened up other opportunities. (Carroll 8.16)

The commentary has highlighted different views about what the actual TOD catalysts were and the respective understandings of the State and Council and again this is evident in the transport versus land use view:

When I started there was lots of talk about it being a transport project, we did have a very healthy period where we got serious about the City Building aspects... I think right now we are almost back to being a transport project, because Queensland Transport and Main Roads is very much about roads and structure and engineering solutions and it is certainly thought of by that body as a transport project. (Grennan 13.9)

I think Council has got it in terms of this being a city building more than a transport project, I am not sure that the State is in that space yet. (Poole 15.3)

Grennan notes the see sawing of objectives and at the time of the interview, as the project prepares the contract for the private sector, the focus is back onto the transport objective. There are varying views about how, why and when the differing objectives come into play. The stronger view is that while land use was an important opportunity, in the CDIMP phase the transport task had to be resolved first. There was the need to satisfy Queensland Treasury and create a viable business case for the project so whilst the land use/TOD objective evolves, it does so only to the extent that it is consistent with these objectives.

Table 6.17 Land Use or Transport? – Abstracted Meaning

GCRT was a transport project
<ol style="list-style-type: none"> 1. Project led by transport objectives. (GB 5.18) 2. Southport, Surfers and Broadbeach would gridlock, so for probably five years that was driving the project rather than changing the land use patterns. (DP 4.10)
AM28 – The project is primarily driven by transport objective.
GCRT led by land use objectives
<ol style="list-style-type: none"> 1. It is a land use project; it comes down to city building. The corridor has probably been selected because of the land use element. (SB 2.46) 2. It certainly is a city building project. It will change the way that residents think about the Gold Coast. (DB 2.47)
AM29 – The project is primarily driven by land use objective.
Led by other objectives
<ol style="list-style-type: none"> 1. Hope it is an urban design project, creating better places and moving people. Community still see the project as a transport project and do not see the benefits. (MK 10.18, 10.19)
AM30 – Hopefully the project is led by urban design.
Project led by transport and land use objectives
<ol style="list-style-type: none"> 1. Viewed from a professional perspective as a transport planning exercise, but have come to recognise the land use factor. The land use benefits are seen as an eye opener to others. A shift in the community view to a longer term vision. The land use issue will influence the planning of future stages. (MC 11.4, 11.5, 11.13) 2. Never just a light rail line. It was an integrated transport project, part of a network and tying in with higher level planning objectives. (MP 6.28) 3. Initially led by transport objectives but in the last three to four years people/business people, start to talk about and understand the development opportunities. (DP 4.16) 4. Project clearly emerges from the transport planning area with strong focus on the mass transit task. City building is part of it. The need for a sustainable mass transit solution is driving the project as much as LU intensification, it is a 50/50 outcome. (KD 3.8, 3.37) 5. It was primarily a transport project but it becomes more of a planning project and the wider economic benefits and city image become more important. (BC 12.18) 6. The system exists because of existing land use and the day one patronage rather than the hope of future development and passengers. (RG 1.35) 7. Once the transit solution was properly landed and because the project made good decisions other opportunities have opened up. (AC 8.16) 8. The project was always about more than transport. It is a land use outcome but was sold as a transport project because that was what people knew. (WR 7.22) 9. It took a long time for the TOD/land use elements to come on. It started evolving about two years into the CDIMP, after the project got the green light from the federal government. (LSS 16.3) 10. Initially a transport project but later focus on land use, concern that it is reverting back to transport. (PG 13.9) 11. Originally the State and Council understood it was a transport project. Council now understands that this is more a city building than a transport project; the state is not in that place yet, maybe in the next wave of policy documents. (TP 15.3)
AM31 – The project was initially led by transport objectives but land use has become a significant driver.

6.6.3 Abstraction of the Condensed Commentary

The primary research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* The final comments in this section respond to the question: *Is GCRT a transport or a land use project?*

This question caps the previous research questions that have structured this research and confirms the significance of the integrated land use and TOD objectives as an evolving and ultimately significant factor in the transit planning process and outcomes. It points to the way in which this process, whilst important, ultimately developed to the extent that it satisfied the transport objective and the business case for the project. The detailed implications of this are considered in Chapter Seven “Concluding the Thesis”.

The following points provide the condensed narrative from the interviews. Appendix G provides the detail of comments that have been selected based on their significance to the research question.

- Abstraction 28 – The project is primarily driven by transport objective.
- Abstraction 29 – The project is primarily driven by land use objective.
- Abstraction 30 – Hopefully the project is led by urban design.
- Abstraction 31 – The project was initially led by transport objectives but land use has become a significant driver.

In this chapter the dominant meaning is that the GCRT project was initially led by transport objectives but that land use became the significant driver. It can also be seen that while these objectives can be in tension, in the GCRT they are realised in a complementary way to satisfy the mobility benefits of the light rail with complementary land uses consistent with the City Building and TOD objectives.

Chapter Six has highlighted the experience of those responsible for the shaping of the GCRT. It shows how the project evolved from being narrowly focused on a transport objective to that oriented to realising integrated land use objectives. Chapter Seven concludes the thesis by cross referencing these condensed meanings from the interviews with the literature review findings and the policy and project documentation. This process provides the original contribution, the application of these lessons and highlights areas for further research.

Table 6.18 Summary of the Abstracted Meanings

	Abstracted Meaning - From Transit to TOD to Development Oriented Transit
AM1	The SEQ transit planning experience is seen as narrow and focussed on transport at the expense of wider integrated land use/TOD planning objectives. (7 comments)
AM2	The project was initially focussed on transport objectives. The land development and public realm focus came later. (8 comments)
AM3	The Nation Building and international experience confirms the wider and longer term transformative City Building and TOD objectives. (6 comments)
AM4	Light rail projects coupled with a longer term vision and the right land development tools can realise significant financial potential. (8 comments)
AM5	The car and the right to parking are seen as part of the Gold Coast lifestyle. Light rail is seen as a catalyst to change the culture and land use in the corridor. (11 comments)
AM6	The light rail will provide desirable, connected and accessible lifestyle choices and contribute to a positive tourist image and the wider perceptions of the city. (10 comments)
	Abstracted Meaning - The Transit Planning Process and Outcomes
AM7	Council had strongly influenced the state government's transport and land use policy objectives. Council initiated the light rail concept in that corridor to progress its land use planning objectives. (9 comments)
AM8	An integrated transport planning approach involves strategic thinking across a range of professional groups and objectives. (4 comments)
AM9	The collaborative culture comes out of a structure and process that engaged different professional views, levels of government and the community. (12 comments)
AM10	In the pre-CDIMP phase Council's transport planners were driving the project in collaboration with land use planners. In the CDIMP the collaboration develops as land use opportunities become clearer, with planners and urban designers working with engineers and transport planners. (5 comments)
AM11	There are project tensions between transport and land use objectives and there are related professional tensions which can be positive but need to be resolved within the context of an integrated planning outcome. (6 comments)
	Abstracted Meaning - Route and Station Locations Enabling TOD
AM12	Since the mid-1990's onwards there was a firm view within Council in favour of light rail for the corridor; this was at odds with the state view in favour of busways. (10 comments)
AM13	Mode was not the end but the means to the end. (7 comments)
AM14	The transit supported existing development and would be a catalyst for new development in the corridor. (6 comments)
AM15	Unless people had seen light rail elsewhere it was difficult for people to understand what the project actually was or why the Gold Coast needed it. (6 comments)
AM16	The LRT's positive image was important to the city and a selling point for the project. (7 comments)
AM17	The LRT is contrasted with the bus/BRT image which was not seen positively in terms of the desired urban image for the city. (7 comments)

AM18	The permanency of light rail was viewed positively. Buses and busways are viewed as flexible and there may be transportation benefits but the flexibility was seen negatively from a land development perspective. (10 comments)
AM19	Segregated systems have some transport benefits but these are negatives for land use which were a factor in the LRT choice. (6 comments)
AM20	Light rail is closely associated with better integration, proximity to the centre and supporting place qualities. (4 comments)
AM21	The transit objective was to access the centre and ensure the quality of station place so the mode needs urban penetration and LRT achieves that. (10 comments)
Abstracted Meaning - Route and Station Locations Enabling TOD	
AM22	The Gold Coast urban form provided a small corridor for development and this is where the development, the density and the activity was. It is obvious that the route was there so then it was a matter of connecting up the dots. (5 comments)
AM23	The RASL was not obvious, at least not in Southport where there was a heated debate about whether to put the light rail out of sight out of mind on Marine Parade, on the edge or in Scarborough Street, the Main Street of the CBD. (6 comments)
AM24	The light rail future extensions were likely to be driven by land use change. (4 comments)
AM25	The international experience shows how these systems would take a long time to develop. (6 comments)
AM26	The RASL requires choices; either the high impact, high cost, high risk, high access route or the low cost, low risk, low impact, low access route. (7 comments)
AM27	The development opportunities drove the RASL but this also increased the level of impact in the centre. (14 comments)
Abstracted Meaning - Is GCRT a Transport or a Land Use Project?	
AM28	The project is primarily driven by transport objective. (2 comments)
AM29	The project is primarily driven by land use objective. (2 comments)
AM30	Hopefully the project is led by urban design. (1 comment)
AM31	The project was initially led by transport objectives but land use has become a significant driver. (9 comments)

Chapter 7 – Concluding the Thesis

7.1 Introduction

This chapter draws together the key findings and their implications in relation to the research questions. The data and conclusions from the literature review, covered in Chapters Two and Three, and the analysis of policy and project documentation, covered in Chapter Five, are considered in relation to the abstracted meanings and new evidence from the interview data analysed in Chapter Six.

The primary research question asks: *How do TOD objectives influence the urban transit planning process and outcomes?* This question is addressed through four sub-questions:

- *How does transit shape the urban environment and transit oriented development objectives in the corridor?*
- *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?*
- *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?*
- *How is the Route and Station Location shaped by Transit Oriented Development objectives?*

After reviewing the new evidence in relation to the research questions, the chapter confirms the original contribution and considers the way in which the lessons from the research can be applied, areas for further research and ways of building on the research findings.

7.2 From Transit to TOD to Development Oriented Transit

Sub-question one asks: *How does transit shape the urban environment and transit oriented development objectives in the corridor?*

7.2.1 What Does the Literature Review Show?

The literature considers the impact of transit in the urban environment with a focus on the transit corridor and its impact on local communities and their accessibility. This chapter contained five themes. Conclusions from these themes are as shown below.

Table 7.1 From Transit to TOD to Development Oriented Transit

LR1	There has been an evolving view of integrated transport and land use planning that looks beyond narrow modernist transport objectives, consistent with TOD. The idea of TOD itself can be seen as a dynamic and evolving concept
LR2	TOD continues to be treated as a land use planning issue rather than a transport planning issue and may be at odds with transport planning objectives and practices such as 'scientific modelling'.
LR3	The idea of TOD can be contrasted with the idea of Development Oriented Transit which considers the TOD enabling factors within the transit planning process.
LR4	Transit decisions actively shape the urban environment and this is evident in the earliest transit/land use planning ideas.
LR5	Transit corridors determine the way in which the urban environment is accessed and are a factor in the realisation of pedestrian friendly urban environments.

7.2.2 What Does the Policy and Project Documentation Show?

A review of the relevant policy and project documentation confirms the 'formal' position of the government and the project. The conclusions are shown below.

Table 7.2 Policy and Project Documentation Conclusion 1

PP1	The SEQ policy and GCRT project documents tend to be neutral on the philosophical and political issues in relation to TOD. The Concept Design and Impact Management Plan (CDIMP) acknowledges the SEQ TOD policy objectives without consideration of the development opportunities within the project or the transit corridor.
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7.2.3 Understanding the Interview Evidence

The interview data has been condensed into a number of data segments and these have been abstracted into six meanings, these are as follows with the number of relevant comments from the interviews indicated.

Table 7.3 Summary of the Abstracted Meanings 1 - 6

AM1	The SEQ transit planning experience is seen as narrow and focussed on transport at the expense of wider integrated land use/TOD planning objectives. (7 comments)
AM2	The project was initially focussed on transport objectives. The land development and public realm focus came later. (8 comments)
AM3	The Nation Building and international experience confirms the wider and longer term

	transformative City Building and TOD objectives. (6 comments)
AM4	Light rail projects coupled with a longer term vision and the right land development tools can realise significant financial potential. (8 comments)
AM5	The car and the right to parking are seen as part of the Gold Coast lifestyle. Light rail is seen as a catalyst to change the culture and land use in the corridor. (11 comments)
AM6	The light rail will provide desirable, connected and accessible lifestyle choices and contribute to a positive tourist image and the wider perceptions of the city. (10 comments)

7.2.4 What is the Original Contribution?

The literature review highlights the evolving knowledge on transit and land use integration. The green shoots of the idea of Development Oriented Transit (DOT) show an evolving approach to transit planning focussed on the enabling of land use development outcomes through transit planning. This is in contrast to the policy and project documentation which does not make a meaningful connection between transit planning and integrated land use outcomes.

The abstracted meanings (AM 1 & 2) show that the Concept Design, following the SEQ transit experience, was initially focussed narrowly on realising transport objectives. The land use/public realm objectives developed in the course of the project. It can be concluded that the GCRT, following the SEQ transit experience, was initially focussed narrowly on the transport objective, but evolved to realise wider land use/public realm and accessibility objectives.

The abstracted meanings, (AM 3 & 4), point to the importance of wider and longer term influences on the project which legitimise integrated land use and TOD such as City Building and financial opportunities. It can be concluded that the longer term TOD objective evolved as a City Building and financial opportunity which was enabled by the mode decision.

The abstracted meanings, (AM 5 & 6), point to the mode as a catalyst for cultural change, connected and accessible lifestyle choices and city image. It can be concluded that the transit – land use dynamic is not value neutral, there are political implications in the transit and related land use outcomes, impacting on resource allocation, lifestyle choices, cultural change, economy and the desirable city image.

7.3 The Transit Planning Process and Outcomes.

Sub-question two asks: *How does the institutional structure and process shape the project and enable integrated transport planning and Transit Oriented Development outcomes?*

7.3.1 What Does the Literature Review Show?

The literature considers the delivery of integrated transport and land use outcomes and the use of transport modelling and its impact on the enabling of TOD. This chapter contained three themes and the conclusions from these themes are shown below.

Table 7.4 The Transit Planning Process and Outcomes

LR6	A renewed interest in integrated land use and transport has underpinned significant investment in new urban transit systems tied to urban renewal and TOD objectives.
LR7	Modernist transit planning is highly specialised, siloed from other planning functions and dominated by engineering values. It tends to prioritise mobility over other objectives that are necessary to realise TOD
LR8	The specialised and siloed nature of transit planning is contrary to the achievement of integrated land use and TOD outcomes.

7.3.2 What Does the Policy and Project Documentation Show?

A review of the relevant policy and project documentation confirms the ‘formal’ position of the government and the project. The conclusions are shown below.

Table 7.5 Policy and Project Documentation Conclusion 2

PP2	In spite of the significant body of SEQ policy and GCRT project documentation there is no consideration of the way in which the project structure or the process work as enabling factors for the transit planning or land use outcomes.
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7.3.3 Understanding the Interview Evidence

The interview data has been condensed into a number of data segments and these have been abstracted into five meanings, these are as follows with the number of relevant comments from the interviews indicated.

Table 7.6 Summary of the Abstracted Meanings 7-11

AM7	Council had strongly influenced the state government’s transport and land use policy objectives. Council initiated the light rail concept in that corridor to progress its land use planning objectives. (9 comments)
AM8	An integrated transport planning approach involves strategic thinking across a range of professional groups and objectives. (4 comments)
AM9	The collaborative culture comes out of a structure and process that engaged

	different professional views, levels of government and the community. (12 comments)
AM10	In the pre-CDIMP phase Council's transport planners were driving the project in collaboration with land use planners. In the CDIMP the collaboration develops as land use opportunities become clearer, with planners and urban designers working with engineers and transport planners. (5 comments)
AM11	There are project tensions between transport and land use objectives and there are related professional tensions which can be positive but need to be resolved within the context of an integrated planning outcome. (6 comments)

7.3.4 What is the Original Contribution?

The literature highlights the relationship between new urban transit investment and urban renewal and TOD objectives, especially in USA and Europe since the 1980s. In the course of this 'renaissance' there has been an increasing tendency to challenge modernist urban transit planning practice and its tendency to be siloed from other planning practice and outcomes. The policy and project documentation does not consider how the project structure or the planning process work as enabling factors for land use outcomes.

The abstracted meanings, (AM 7, 8 and 11), show the broader planning focus of Council in shaping the development of the light rail concept to realise integrated transport and land use planning objectives. It can be concluded that whilst the literature and policy documentation is generally silent on the issue of project structure or process, the integrated structure and collaborative process of GCRT is important and is associated with the achievement of integrated land use planning and TOD outcomes. The project, as conceived by Council, transcended the siloed and specialised nature of modernist planning practice.

The abstracted meanings, (AM 9 and 10), show an evolving process of collaboration which developed with the integrated TOD objectives. It can be concluded that the enabling of TOD was strongly associated with the integrated and collaborative working environment that was cultivated within the GCRT project team.

7.4. Mode and System Characteristics Enabling TOD

Sub-question three asks: *How are the Mode and System Characteristics shaped by Transit Oriented Development objectives?*

7.4.1 What Does the Literature Review Show?

The literature considers the way in which transit shapes TOD outcomes, the issue of transit corridor permeability and the Mode and System Characteristics (MASC). This chapter contained four themes and the conclusions from these themes are shown below.

Table 7.7 Mode and System Characteristics Enabling TOD.

LR9	Transit is not neutral in the urban environment. MASC can be seen to impact on RASL options and ultimately impact on the land use outcomes. Light rail is associated with urban TOD and bus/BRT is associated with lower density land use and park and ride.
LR10	Transit Corridor Permeability (TCP) is a MASC factor in the urban environment. High quality and efficient mobility can be achieved but requires corridor segregation and urban edges/barriers which impact negatively on accessibility in station precincts.
LR11	Bus Rapid Transit provides an efficient transit solution, especially for low density urban environments. This efficiency is realised through highly segregated corridors to enable high bus frequency and speed. Stations tend to support park and ride. Where BRT runs into dense urban areas they are often barriers to pedestrian access.
LR12	Australian LRT systems have tended to be segregated in heavy rail alignments. More recent extensions have been integrated into dense urban environments and ensured opportunities for urban renewal, local economic activity and a level of pedestrian access appropriate for TOD.

7.4.2 What Does the Policy and Project Documentation Show?

A review of the relevant policy and project documentation confirms the ‘formal’ position of the government and the project. The conclusions are shown below.

Table 7.8 Policy and Project Documentation Conclusion 3

PP3	Mode is treated as neutral in the urban environment. Differences between BRT and LRT are not acknowledged nor related to impacts on the RASL outcomes. There is a failure to explain why one mode tends towards park and ride outcomes whilst another is associated with integrated land use and TOD outcomes.
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7.4.3 Understanding the Interview Evidence

The interview data has been condensed into a number of data segments and these have been abstracted into ten meanings. These are as follows.

Table 7.9 Summary of the Abstracted Meanings 12-21

AM12	Since the mid-1990's onwards there was a firm view within Council in favour of light rail for the corridor; this was at odds with the state view in favour of busways. (10 comments)
AM13	Mode was not the end but the means to the end. (7 comments)

AM14	The transit supported existing development and would be a catalyst for new development in the corridor. (6 comments)
AM15	Unless people had seen light rail elsewhere it was difficult for people to understand what the project actually was or why the Gold Coast needed it. (6 comments)
AM16	The LRT's positive image was important to the city and a selling point for the project. (7 comments)
AM17	The LRT is contrasted with the bus/BRT image which was not seen positively in terms of the desired urban image for the city. (7 comments)
AM18	The permanency of light rail was viewed positively. Buses and busways are viewed as flexible and there may be transportation benefits but the flexibility was seen negatively from a land development perspective. (10 comments)
AM19	Segregated systems have some transport benefits but these are negatives for land use which were a factor in the LRT choice. (6 comments)
AM20	Light rail is closely associated with better integration, proximity to the centre and supporting place qualities. (4 comments)
AM21	The transit objective was to access the centre and ensure the quality of station place so the mode needs urban penetration and LRT achieves that. (10 comments)

7.4.4. What is the Original Contribution?

The literature shows how transit Mode and System Characteristics (MASC) shape, and are shaped, by the urban environment. LRT is particularly associated with higher density urban environments and TOD and bus/BRT with lower density and park and ride. The literature shows BRT and LRT as having different MASC, such as vehicle speed and frequency or need for overtaking in stations, with different impacts in the urban environment. Australian light rail tends to be segregated into older heavy rail alignments but it is also able to integrate into the urban environment and is complementary to urban renewal and TOD. The policy and project documentation treat the MASC as neutral in the urban environment and do not acknowledge the way in which MASC impacts on the Route and Station Location outcomes.

The abstracted meanings, (AM 12, 13 and 14), show that Council had a firm view in favour of LRT with a view to enhancing the coastal corridor and as a catalyst for new development. It can be concluded that the MASC decision was seen as a means to enhance existing and future land use development and light rail supported this objective.

The abstracted meanings, (AM 15, 16 and 17), show that, according to several interviewees, the wider community did not generally understand the transit/land use issues but they did understand the differences in the mode image and this was an issue in favour of light rail rather than bus/BRT. It can be concluded that light rail was preferred as it complemented

the existing urban form and desired future development in the corridor whilst the community supported it for its stronger urban image.

The abstracted meanings, (AM 18, 19, 20 and 21), show a positive view in favour of light rail's permanency with urban penetration supporting accessibility, walkability and station place qualities. It can be concluded that the preference for light rail was related to its ability to integrate into the urban environment, its potential to penetrate the centre and support existing urban development, and for its perceived permanency which supported new development with enhanced mobility.

7.5. Route and Station Locations Enabling TOD

Sub-question four asks: *How is the Route and Station Location shaped by Transit Oriented Development objectives?*

7.5.1 What Does the Literature Review Show?

The literature highlights the RASL inter-relationship with the MASC and as an enabler for land use outcomes. The findings from this chapter are condensed into the theme below.

Table 7.10 Route and Station Locations Enabling TOD

LR13	The RASL decisions are a product of MASC and shape the land use outcomes which are also shaping the RASL options. BRT systems that require segregation tend toward urban edge locations, whilst LRT RASL are able to run into centres and support urban TOD outcomes.
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7.5.2. What Does the Policy and Project Documentation Show?

A review of the relevant policy and project documentation confirms the 'formal' position of the government and the project. The conclusions are shown below.

Table 7.11 Policy and Project Documentation Conclusion 4

PP4	There is no acknowledgement of the relationship between the RASL and either the MASC or the land use outcomes.
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7.5.3. Understanding the Interview Evidence

The interview data has been condensed into a number of data segments and these have been abstracted into six meanings, these are as follows.

Table 7.12 Summary of the Abstracted Meanings 22-27

AM22	The Gold Coast urban form provided a small corridor for development and this is where the development, the density and the activity was. It is obvious that the route was there so then it was a matter of connecting up the dots. (5 comments)
AM23	The RASL was not obvious, at least not in Southport where there was a heated debate about whether to put the light rail out of sight out of mind on Marine Parade, on the edge or in Scarborough Street, the Main Street of the CBD. (6 comments)
AM24	The light rail future extensions were likely to be driven by land use change. (4 comments)
AM25	The international experience shows how these systems take a long time to develop. (6 comments)
AM26	The RASL requires choices; either the high impact, high cost, high risk, high access route or the low cost, low risk, low impact, low access route. (7 comments)
AM27	The development opportunities drove the RASL but this also increased the level of impact in the centre. (14 comments)

7.5.4. What is the Original Contribution?

The literature review context shows that RASL decisions are related to MASC. In turn these decisions impact on land use outcomes. The policy and project documentation does not acknowledge the relationship between the RASL and MASC or the related land use outcomes.

The abstracted meanings (AM 22, 23, 24, 25, 26 and 27) show there are RASL options and choices, some more obvious than others. Decisions must be made and each of these decisions has its own consequences. The decision that was made was to have the transit run in the urban centre to support existing and future development opportunities rather than on the urban edge. It can be concluded that, whilst the policy does not link RASL to TOD, the GCRT RASL options were shaped by the land use/TOD objective; to run in the centre, and support existing and potential development.

7.6 Is GCRT a Transport or a Land Use Project?

The question of whether the GCRT is a transport or land use project came out of the interview process rather than the literature review or the policy or document analysis. This question goes to the heart of the idea of 'Development Oriented Transit'.

The abstracted meanings from the interviews are as follows with the number of respondents who put forward each proposition shown at the end of the abstracted meaning.

Table 7.13 Summary of the Abstracted Meanings 28-31

AM28	The project is primarily driven by transport objective. (2 comments)
AM29	The project is primarily driven by land use objective. (2 comments)
AM30	Hopefully the project is led by urban design. (1 comment)
AM31	The project was initially led by transport objectives but land use has become a significant driver. (9 comments)

There was a minority view that the GCRT was primarily driven only by transport objectives although the interviews are not entirely consistent on this point, often noting, at some stage, the importance of the land use objective for the project. There was also a minority view that the GCRT was led solely by the land use objectives, again these interviewees were not entirely consistent in this view, at times emphasising the importance of the transport objective. There was also one view that the GCRT was driven by urban design objectives although, again, there was also support for the view that land use was also a key objective. Whilst this seems to be an isolated view it is evident that there was a concern by many of the interviewees to realise quality urban design and City Building outcomes in terms of functionality and accessibility and for safe and enjoyable station places.

The view of the majority of the interviewees was that the project was initially led by transport objectives but that the land use had become a significant driver. It is notable that many of the respondents referred to the evolving nature of this theme.

The data shows that whilst Council favoured light rail as a catalyst for land use and the State pursued a transport objective, in the course of the project the idea of TOD 'evolved' as a central objective. This is a view that can be related to the evolving structure and process of the project team and the TOD enabling decisions, specifically the MASC and the RASL.

In conclusion, the evidence substantially supports a view of the GCRT project evolving from a transport project to a project increasingly focussed on realising land use/TOD objectives.

7.7 Confirming the Original Contribution

This section consolidates the research findings to confirm the original contribution. The research questions focus on how the TOD – land use objective influences the urban transit planning process and outcomes. The findings highlight the way in which the transit planning process shapes integrated land use and TOD outcomes, and reveal that this is a dynamic ‘push-pull’ process working in both directions. The research extends the knowledge outlined in the framework developed from the existing knowledge, shown below, which highlights a transit – land use relationship shaped by modernist transport planning values.

Table 7.14 Theoretical Framework – Developed from the Condensed Literature Review Findings (at Section 3.5)

Main RQ - How do TOD objectives influence the urban transit planning process and outcomes?					
	Sub RQ1 How does transit shape the urban environment and TOD objectives in the corridor?	Sub RQ2 How does the institutional structure and process shape the project and enable integrated transport planning and TOD outcomes?	Sub RQ3 How are Mode and System Characteristics shaped by TOD objectives?	Sub RQ4 How is the Route and Station Location shaped by TOD objectives?	Research conclusions
Existing Knowledge	Transit corridors as impermeable edges and a barrier to ped access and TOD	Tends towards modernist, siloed, specialised, with narrow transport planning focus.	Values transport/mobility speed and time efficiency	Requires segregated right of way. Transit corridor creates barrier to access	TOD: Development is oriented to the transit objective. lower integration and lower yield land use.

The specific contributions to knowledge are summarised below.

7.7.1 From Transit to TOD to Development Oriented Transit

The following conclusions were drawn from the abstractions earlier in this chapter:

The GCRT, following the SEQ transit experience, was initially focussed on the transport objective, at the expense of land use, but evolved to realise wider land use/public realm and accessibility objectives.

The longer term TOD objective evolved as a City Building and financial opportunity and this was enabled by the mode decision.

The transit – land use dynamic is not value neutral, there are political implications in the transit and related land use outcomes, impacting on resource allocation, lifestyle choices, cultural change, economy and the desirable city image.

The first original contribution from this research highlights the notion of TOD and integrated land use objectives as dynamic and evolving concepts within the transit project, enabled by the characteristics of the transit planning process. It highlights the range of possible objectives and the notion of transport as the means to the end rather than the end itself.

7.7.2 The Transit Planning Process and Outcomes.

The following conclusions were drawn from the abstractions earlier in this chapter:

Whilst the literature and policy documentation is generally silent on the issue of project structure or process the integrated structure and collaborative process of GCRT is important and clearly associated with the achievement of integrated land use planning and TOD outcomes. The Gold Coast light rail project, as conceived by Council, was able to transcend the siloed and specialised nature of modernist transport planning practice.

The enabling of TOD was strongly associated with the integrated and collaborative working environment that was cultivated within the GCRT project team.

The second original contribution from this research is to highlight the way in which the integrated team structure and collaborative working environment work as enabling factors for integrated land use and TOD outcomes. This can be contrasted with modernist planning practice which tends towards a siloed, specialised and narrow transport/mobility focus.

7.7.3 Mode and System Characteristics Enabling TOD

The following conclusions were drawn from the abstractions earlier in this chapter:

The mode decision was ultimately seen as a means to enhance existing and future land use development and light rail supported this objective.

Light rail was preferred as it complemented the existing urban form and desired future development in the corridor whilst the community supported it for its stronger urban image.

The preference for light rail was related to its ability to integrate into the urban environment, its potential to penetrate the centre and support existing urban development, and for its perceived permanency which supported new development with enhanced mobility.

The third original contribution from this research is the confirmation of the dynamic relationship between the mode decision and the desired land use objectives. The TOD – integrated land use objective challenged the conventional - modernist transport/mobility practice focused on realising conventional time and speed efficiency imperatives.

7.7.4 Route and Station Locations

The conclusion drawn from the abstractions in this chapter is that whilst the policy does not link RASL to TOD the GCRT RASL options were shaped by the integrated land use and TOD objective; to run in the centre, and support development. It highlights the issue of choice created by the MASC decision and choices about the desirable land use objectives. RASL is treated as passive in the policy and much of the literature but should be seen as a significant TOD enabler.

The fourth original contribution from the research is the confirmation of the enabling relationship between RASL and MASC and in turn the land use and TOD outcomes. The focus on providing transit access to the centre highlighted the need for MASC permeability and penetration of the centre. The GCRT RASL options were shaped by the land use/TOD objective; to run in the centre, and support existing and potential development.

7.7.5 Is GCRT a Transport or a Land Use Project?

The conclusion drawn from the abstractions earlier in this chapter is that the evidence substantially supports a view of the GCRT project evolving from a transport project to a project increasingly focussed on realising complimentary land use and TOD objectives.

The fifth original contribution from this research reaffirms the value of the collaborative planning environment. It underpins an integrated transport planning process which, in the case of the GCRT, evolved from a conventional modernist and narrowly focussed transport project to one able to respond to and realise wider urban planning objectives.

7.7.6 Summary of the Original Contribution

Following the significant trend to sustainable planning, Australian urban transit policy is increasingly focussed on realising integrated land use and TOD outcomes. The results however, especially in South East Queensland, have not been consistent with this intent. Transit stations continue to be located out of centre with little to no development or future development potential. Consequently, many people continue to drive to conduct day to day activities, such as work, shopping or recreation, or they need to drive to access urban transit to conduct these activities. This cannot be described as a 'best practice' sustainable urban planning outcome.

This research provides a qualitative exploration of how TOD objectives influence the urban transit planning process and outcomes and uses the Gold Coast Rapid Transit (GCRT) as a case study. It seeks to better understand how TOD objectives influence the transit planning process and outcomes and, in turn, show how the transit planning process may enable stronger integrated land use and TOD outcomes. This 'enabling' view of the transit planning process has not been considered in any detail prior to this thesis and this respect the unique findings are especially useful to future considerations about urban transit planning and TOD.

This research can be contrasted with the literature which treats land use as an outcome of transit planning. Transit Oriented Development, that is development which is oriented to the transit, can be contrasted with the idea of Development Oriented Transit (DOT) which looks beyond the entrenched paradigm of modernist transit planning practice which treats transport as the end rather than the means to better land use outcomes. DOT puts the focus back onto the transit planning process and outcomes to ensure transit decisions that support sustainable urban planning and development outcomes.

This research shows TOD and integrated land use objectives as evolving concepts in the GCRT transit planning process, enabled by an integrated team structure and collaborative

working environment. The transit planning process decides MASC and RASL outcomes which shape the land use outcomes. By treating the relationship as dynamic the pattern can be read in either direction so that the land use/TOD objective can shape the enabling factors, MASC and the RASL, through this collaborative and integrated transit planning process.

Table 7.15 below contrasts the existing with the new knowledge in relation to each of the research questions and the way in which a modernist and mobility focussed approach to transit and transport tends towards transit outcomes inconsistent with accessible urban centres and the TOD objective. It highlights the problem of a siloed and specialised transit planning process and outcomes where key enabling decisions are oriented to the transport objective, leading, quite literally, to ‘transit oriented development’.

Table 7.15 Original Contribution (in green boxes) building on the Theoretical Framework (in blue boxes)

Main RQ - How do TOD objectives influence the urban transit planning process and outcomes?					
	Sub RQ1 How does transit shape the urban environment and TOD objectives in the corridor?	Sub RQ2 How does the institutional structure and process shape the project and enable integrated transport planning and TOD outcomes?	Sub RQ3 How are Mode and System Characteristics shaped by TOD objectives?	Sub RQ4 How is the Route and Station Location shaped by TOD objectives?	Research conclusions
Existing Knowledge	Transit corridors as impermeable edges and a barrier to ped access and TOD	Tends towards modernist, siloed, specialised, with narrow transport planning focus.	Values transport/mobility speed and time efficiency	Requires segregated right of way. Transit corridor creates barrier to access	TOD: Development is oriented to the transit objective. lower integration and lower yield land use.
New Knowledge	GCRT transit corridor as permeable seam supporting ped access and TOD	Tends towards an integrated team structure and a collaborative working environment	Values a balance of MASC with ILU/TOD objectives. Enables RASL integration into urban environment.	MASC permeability provides opportunity for RASL to penetrate “Main Street” activity centre.	DOT: (Development Oriented Transit). Achieves higher integration in the centre and high yield land use

7.7.7 Responding to the Research Question

The research question and sub questions purposely inverts the modernist transit planning process by asking how TOD objectives influence the transit planning process and outcomes. Looking at Table 7.15 the question starts with the transport objective outlined in blue from

left to right, as is the established convention, but this is a dynamic relationship so the table can also be read from right to left in the green boxes starting with the land use objective leading to a transport outcome. This process, which can be contrasted with that leading to Transit Oriented Development, supports a Development Oriented Transit (DOT) outcome.

DOT, as illustrated above, emphasises the way in which realising integrated transit/land use objectives requires an integrated transit planning process involving a range of professions working collaboratively to realise objectives beyond pure transport planning outcomes.

7.8 The Application of Lessons

As many cities invest in at grade urban transit projects and seek land use outcomes consistent with TOD it is timely to consider the way in which integrated transit projects are delivered. The specific lessons from this research are considered in relation to the transport and land use/TOD policy, project and concept design documentation and the transit planning process and its outcomes.

7.8.1 The Transit/TOD Policy and Transit Planning/CDIMP Documentation

The literature, policy and project documentation tends to deal with TOD narrowly and as a land use issue. Alternatively the literature, policy and project documentation on 'integrated transport' tends to acknowledge land use and TOD objectives in passing, or alternatively as transit oriented communities (TOC) thus avoiding the land use question altogether.

This research expands the understanding about transit, integrated land use and TOD. It looks beyond a conventional/modernist approach, to some extent back to a pre modernist-holistic approach to planning; that treats land use and transit as part of the same planning problem.

The research shows that a successful policy for TOD needs to ensure that the land use/TOD objective is not a superficial add on to the transport planning process but instead is embedded in the 'DNA' of the planning process and a key factor in determining issues of mode, route and station locations. Realising this objective requires that the policy and project documentation note the importance of an integrated planning practice and process.

7.8.2 Transit Planning Practice and Process

Significant transit projects tend to be overseen by civil engineers while other professionals tend to provide input as required, reflecting the tendency to treat major transit projects in the same way as major road/highway projects with the application of similar planning and engineering values. The land use and TOD objective become an add on instead of significant objectives embedded within the transit project and balanced with the transport objective.

This research highlights the importance of the transit planning practice and process. It emphasises the value of a collaborative and integrated team and process. It shows how the GCRT approached the development of complex transit/land use objectives as a learning process so that objectives and ideas are able to evolve and opportunities may develop. It is evident that this process came out of the partnership between the State Government and Gold Coast City Council, and later the Commonwealth, each with their own planning needs, initially in tension but in time working as a team to realise integrated planning solutions.

This approach requires that a broad range of professionals are engaged, including land use planners, urban designers and engineers, and that all parties are involved from the early planning phase and through the whole of the planning and design process to ensure that the key enabling decisions reflect the wider objectives.

An approach that looks beyond narrow transport objectives must also have a view that looks beyond short term costs and risks to realise longer term outcomes/benefits. There are therefore other professionals and parties involved that need to understand and endorse this approach. In the case of the GCRT this especially included the involvement of State Treasury.

These are the higher level learnings gained from an exploration of the GCRT planning process. They clearly have relevance for other urban transit projects seeking to achieve TOD outcomes, especially when it is clear that the rhetoric for integrated planning and TOD has been well short of that expected. It follows that in time there may be a growing body of work that can provide a broader body of data for further research.

7.9 Areas for Further Research

There are a number of issues arising from this research deserving of further investigation. Firstly, this is a single case study providing an insight into one urban transit project. It is appropriate that more studies be undertaken to explore and test these findings. Given the rarity of such projects, further research should include international case studies.

This research is qualitative. There is a need for a stronger qualitative and exploratory investigation into the way in which transport and transit projects are delivered in relation to their impacts in the urban and social environment.

In terms of specific questions for further research, there is a need for further investigation of the way in which the structure and decision making process within a number of transit projects has had implications for land use and TOD outcomes.

This research also raises questions about the effectiveness of a TOD policy based on a modernist planning practice. A broader study of integrated land use and TOD policy might establish a stronger relationship between the transport and land use policy, practice and outcomes including the wider governance structures in relation to land use and transport. A study of European versus Australian and North American policies would be useful here.

Finally, there are references in this research to the idea of 'Transit Corridor Permeability'. This was intended to have a higher profile in this research however there was difficulty using a qualitative method to capture such a concept. In the course of examining Australian urban transit systems the author conducted preliminary research and notes the high correlation between out of centre station locations and highly segregated light rail or busways. Further research might consider issues of spatial analysis in relation to transit corridors, stations and the places that they are intended to serve. Understanding the relationship between Transit Corridor Permeability and TOD may improve transit planning and TOD outcomes.

This research has challenged an established set of ideas about the way in which land use planning and transit/transport planning is conducted. In the same way that the idea of TOD and DOT challenge the modernist and siloed view of transport planning, so too should future research related to this work be prepared to challenge the established ideas and interests.

7.10 From Transit to TOD to Development Oriented Transit – Conclusion

This research asks the question ‘how’ and is concerned to explore the idea of TOD and how it influences, and is influenced by, the transit planning process. This exploration provides a unique insight into an area of transit planning practice that is not well understood.

TOD is increasingly a feature of planning policy in SEQ, across Australia, and internationally, as cities seek to improve sustainability through urban planning and design practice. TOD is approached in this research as a public good; that is improved station place qualities with greater accessibility, walkability, vibrant mixed use economy in a functional dense urban form. This research has been motivated by a desire to improve these outcomes. It is evident that transit planning practice has not, to date, been engaged to enable these objectives.

The research approach has drawn a theoretical framework from the literature that informs the research question. In this framework the Mode and System Characteristics and the Route and Station Locations are identified as key enablers for land use and TOD.

The GCRT shows that this relationship can work in reverse. It was clear that the Council intended to use light rail as a catalyst for land development. In this scenario the transit project is as much a land use project as it is a transport project. The question was how would the TOD objective influence the transit planning process and outcomes?

The idea of TOD is now well entrenched in the international and Australian literature and policy but there remains a substantial gap between the promise of TOD and its delivery. This exploratory research into the Gold Coast Rapid Transit planning process looks beyond a literal view of ‘Transit Oriented Development’ with all of its modernist implications, towards a proactive, post or maybe pre-modernist, ‘Development Oriented Transit’.

In the same way that TOD challenges urban design and planning practice to support transit so too can DOT challenge transit planning practice for improved land use outcomes.

The significant problems we face cannot be solved at the same level of thinking we were at when we created them. Albert Einstein

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***Transitioning from Transit Oriented Development
to Development Oriented Transit:
A Case Study of the Gold Coast Light Rail Project***

By David Neil Mephram

Submitted in total fulfilment of the requirements of the
degree of Doctor of Philosophy

**Bond University
Institute of Sustainable
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Section Two – Appendices

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Appendix A – TOD Guidelines Queensland Government

Excerpt from - Transit Oriented Development: Guide for Practitioners in Queensland –

1 Transit oriented development in Queensland

1.1 What is transit oriented development?

Transit oriented development is a planning concept that promotes the creation of a network of well-designed, human-scale urban communities focused around transit stations. While there are various definitions in use around the world, there is common agreement that transit oriented development is characterised by:

- a rapid and frequent transit service
- high accessibility to the transit station
- a mix of residential, retail, commercial and community uses
- high quality public spaces and streets, which are pedestrian and cyclist friendly
- medium- to high-density development within 800 metres of the transit station (i.e. the TOD precinct)
- reduced rates of private car parking.

The term ‘transit oriented development’ is often used incorrectly to describe a single development adjacent to or above a transit station. TOD refers to the set of principles applying to the broader precinct surrounding the station, rather than any individual development within it.

Development projects next to a station or in the airspace above the transport corridor are known as ‘joint development’ and may be important catalysts for TOD, if designed well. However, they can inadvertently reduce a location’s TOD potential if they block access to the station or contain uses that are not transit-supportive.

TOD precincts generally include the neighbourhood within a comfortable 10-minute walk of the transit station (a radius of about 800 metres). The concept of TOD is in some ways a return to the traditional neighbourhoods and village communities of the pre-war years. Unlike dormitory suburbs and car-dominated developments, TOD provides a mix of different land uses and community services and facilities so people can live, work, shop and socialise within a short walk, cycle or transit trip of their home return to the traditional neighbourhoods and village communities of the pre-war years. Unlike dormitory suburbs and car-dominated developments, TOD provides a mix of different land uses and community services and facilities so people can live, work, shop and socialise within a short walk, cycle or transit trip of their homes.

Appendix B – GCRT Project Time Line

- 1995 Regional Framework for Growth Management (RFGM) published.
- 1997 Integrated Regional Transport Plan (IRTP) published.
- 1997 – 1998 Gold Coast Light Rail - Foundation and Feasibility Study.
- September 1998 - Gold Coast - City Transport Plan published.
- 2005 South East Queensland Regional Plan published.
- Mid 2006 - SEQIPP confirms project and allocation.
- Late 2006 – Concept Design and Impact Management Plan (CDIMP) announced.
- Early 2007 - start of GCRT – CDIMP.
- March 2007 – Two Southport route options presented to community.
- March – June 2007 Southport consultation process on route options.
- September 2008 - Draft CDIMP with Mode and Route and Station Locations finalised.
- September 2008 - GCCC confirms its contribution of \$120m.
- March 2009 - Final CDIMP and Business Case.
- May 2009 - \$365m from Commonwealth Government/Infrastructure Australia.
- June 2009 - \$465m from Queensland Government.
- Late 2009 - Expressions of Interest (six respondents).
- Early 2010 – Three EOI respondents proceed to ‘Request for Proposals.’
- Late 2010 - RFP’s returned.
- May 2011 - GoldLinq offer is confirmed.
- June 2011 – GCRT Financial close.

Appendix C - Explanation of Key Terms

There are number of terms used in this research that are not explained in the body of the paper. For the purpose of clarity the following simple definitions are provided.

- At grade - Transit operating on street level.
- Closed Rapid Transit – system with specialised vehicles only in a closed system.
- Development Oriented Transit (DOT) A term used in this research to emphasise the practice of transit planning that is oriented to achieving land use development objectives. This can be contrasted with a modernist transit planning approach concerned primarily, it not exclusively, with the pursuit of transport objectives.
- Open Rapid Transit System – system that allows for many transit vehicles from a variety of external routes to come into segregated corridor
- Transit Corridor Permeability – This is a concept specific to this research and is used to highlight the impact of the transit corridor in the urban environment with particular regard to the permeability of that corridor or alternatively the extent to which the corridor is segregated from the urban environment. A simple rule of thumb used to determine TCP is the ability of pedestrian and cyclists to mode through the transit corridor at grade – what is the level of comfort and convenience.
- Transit node the transit station and immediate surrounds.
- Transit Oriented Development (TOD) There are TOD definitions provided in the text. The use of the term has particular regard to the urban design elements that impact on walkability, therefore TOD needs to be seen in a holistic way, from the pedestrian view with regard to the public realm rather than a development.
- Right of Way – corridor that provides priority for certain vehicles over other movements.

Appendix D – Bond University Ethics Clearance



HUMAN RESEARCH
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3 February 2011

A/P Daniel O'Hare, David Mepham
Faculty of Business and Sustainable Development
Bond University

Dear Daniel and David

Project No: RO1249
Project Title: Enabling factors for transit and land use and accessible TOD achieved in the transit planning process

I am pleased to confirm that your Project, having been reviewed under the Expedited Review Procedure, has been granted approval to proceed.

It is important to remember that BUHREC's role is to monitor research projects until completion. The Committee requires, as a condition of approval, that all investigations be carried out in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Research Involving Humans and Supplementary Notes. Specifically, approval is dependent upon your compliance, as the researcher, with the requirements set out in the National Statement.

Additionally, approval is given subject to the protocol of the study being under taken as declared in your application, with amendments, where appropriate.

As you may be aware the Ethics Committee is required to annually report on the progress of research it has approved. We would greatly appreciate notification of the completed data collection process and the study completion date.

Should you have any queries or experience any problems, please liaise directly with Caroline Carstens early in your research project: Telephone: (07) 559 54194, Facsimile: (07) 559 51120, Email: buhrec@bond.edu.au.

We wish you well with your research project.

Yours sincerely

Dr Mark Bahr
Chair

Appendix E – List of Interviewees

1. Gary Baildon. Former GCCC Mayor. Interviewed Gold Coast, February 2011.
2. Adrian Bitzios. Bitzios Consulting. Interviewed Gold Coast, February 2011.
3. Adam Boersma. Manidis Roberts Consultants. Gold Coast, March 2011.
4. Steve Brooke. Former GCCC/ Bitzios Consulting. Gold Coast, February 2011.
5. Anna Carroll. Director, Gold Coast Rapid Transit. Gold Coast, February 2011.
6. Bryan Case. Major Projects, Gold Coast City Council. Gold Coast, February 2011.
7. Michael Chang. GCCC/Gold Coast Rapid Transit. Gold Coast, February 2011.
8. Ken Deutscher. Former GCCC Consultant. Gold Coast, February 2011.
9. Paul Grennan. Manager, Gold Coast Rapid Transit. Gold Coast, February 2011.
10. Rod Grose. GCCC Transport Planning Manager. Gold Coast, February 2011.
11. Marek Kozlowski. GCCC Urban Design Team Leader. Gold Coast, February 2011.
12. Rob Molhoek. Former GCCC Councillor, MP. Southport. Gold Coast, February 2011.
13. Michael Papageorgiou. Former GCCC, Qld Government. Gold Coast, February 2011.
14. Tim Poole. Project Director, Gold Coast Rapid Transit. Gold Coast, February 2011.
15. David Power. Deputy Former GCCC Dep. Mayor /Consultant. Gold Coast, Feb 2011.
16. Warren Rowe. GCCC Director Planning - Transport. Gold Coast, Feb 2011.
17. Leon Seymour Smith. Consultant, MWH. Gold Coast, February 2011.

Appendix F - Questions used in the Interviews

Core questions asked to structure the interview
1. What was the time frame for participants activity in the GCRT project?
2. What people and groups promoted the project - what professions, values, objectives?
3. How do the particular professional groups perceive their role in the transit/land use integration and TOD planning process?
4. What was the significance to the project of the SEQ transport and land use policies at the time
5. Achieving TOD objectives - how did this develop, what time period?
6. How was TOD enabled? What were the enablers?
7. Discuss MASC and RASL - explain each proposition and discuss.
8. Discuss transit and land use relationship in GCRT
9. Invite final comments

Appendix G – Content Analysis of Interview Data – Extended Version

The extended version of the interview data is provided here to enable the reader to cross reference the content in Chapter Six – ‘Interpreting the Interview Data’ with the wider interview context. The data is dealt with in five sections:

1. Transit Shaping Land Development and TOD Objectives.
2. The Transit Planning Structure and Process Enabling TOD.
3. Enabling TOD - Mode and System Characteristics.
4. Enabling TOD - Route and Station Location.
5. Is GCRT a Transport or a Land Use Project?

The following is an extract from the original interviews which cover a broader range of matters to those dealt with in this research. The extract in this document shows the original interview extract with an abstracted meaning highlighted in red. The abstracted meanings have been refined in the final draft of Chapter Six – ‘Interpreting the Interview Data’.

Section One – Transit Shaping Land Development and TOD Objectives

The Transport/TOD Tension

I think we put too much focus on travel time, to be honest, we used that initially... to try and bring the Councillors who were not convinced over the line, that we would reduce travel time, free up road space... but it seemed with some to become too much of a focus rather than on the renewal part, particularly around the transit stops, and particularly in the older areas like Mermaid, Miami and Palm Beach (Power: 4.12).

[There was too much initial emphasis on the transport objectives in the GCRT rather than the opportunities for urban renewal. DP 4.12]

... and you could postulate a system that had a lot more stops in it that met individual needs and opportunities but at the end of the day you only need so many stations A to B, C to D people don't want to be stopping every 100 metres (Grose: 1.34).

[Individual needs may be at odds with the transport systems operational needs. RG 1.34]

What was topical at the time was the discussion around the failure of Robina Town Corporation and Queensland Rail to properly align the station with the shopping centre... The shopping centre was being developed just as I arrived... it would have needed some sort of lease arrangement... to come through the development, and that agreement could not be

reached amongst the parties on that so it was more an operational concern that left them 800 metres apart... Another famous story with the Gold Coast railway line was that the new stations at Ormeau and Coomera. There was a concern from the transport planners at the time that it would slow the train down... It is a difference, not a conflict of transit integration but a conflict about project delivery which is that if the project scope was to deliver a piece of infrastructure within a certain budget then it led to decisions ... at the project level that are not consistent with an overall framework (Papageorgiou: 6.19, 6.20, 6.21).

[Transport operational needs with the Gold Coast rail line were put before the land use objectives. The project scope and budget was not consistent with these wider objectives. MP 6.19, 6.20, 6.21]

I think originally the heavy rail was perhaps a true example of an engineering solution and not an integrated engineering and planning solution... about moving people from Gold Coast to Brisbane as quickly as possible and it does that pretty well... speeds were not reduced and where they had to reduce fill, bridge links almost dictated where the line was going to go rather than who might utilise it so there are a number of stations along the Beenleigh to Gold Coast route that are adjacent to flood plains that do not have ideal topography adjacent to them or are adjacent to highways that don't afford good residential amenity so their walk up catchments are quite small so people have to get into cars to drive to the rail station to use them so they are now surrounded by huge car parks the likelihood is that they will have to extend and expand that car parking to meet the demand so it is not truly a transit oriented solution, it is a transport solution nevertheless, it does move a lot of people very quickly there and it takes those people off the road system, so if gets any ticks it gets it for that, most of those stations, given how long they have been in play, most of them have little or nothing beside them, ... (Case 12.7).

[Gold Coast heavy rail is an effective transport engineering solution but achieves operational efficiency at expense of land development opportunities. BC 12.7]

The Brisbane South East Busway had lots of transit [oriented development] opportunities like Holland Park West and its gone absolutely nowhere... Had it gone through Stones Corner, Greenslopes and Holland Park where there was rudimentary TOD in existence at each of those places it might have built up in to something more (Grose: 1.37).

[The Brisbane busway had TOD opportunities but they have not been realised as the route did not enable existing opportunities. RG 1.37]

I don't know if I mentioned to you about the bus lanes at Miami. It was not fault of the guys that did it but brief was to build bus lanes, either side..., what they did not acknowledge was that there was a big land use interaction each side of the corridor and probably set that back about ten years, prevented that interaction... So while I can see why they did that; it was in their brief, and of course the solution was totally ignorant of them (Deutscher: 3.17).

[The brief for bus lanes transport project ignored the significant land use interactions ultimately prevented that interaction. KD 3.17]

In relation to the issues to the State policy, there is a policy in the SEQRP on TOD, is there any evidence that that policy is being factored into the planning process? I think there were individuals who were fully aware of that policy and used their own sphere of influence to have that activated, but in the formal sense I really, I certainly did not see that in Stage One at all, there was a lack of interest in integrated transport planning, including some of these outcomes for the project, I think it was very much the project team members themselves that tried to align what we were doing with that policy (Grennan: 13.8).

[There was a lack of formal interest in the SEQ integrated transport planning policy objective except for the specific commitment of project team members. PG 13.8]

I think again you have got to be careful because occasionally you can sound a bit elitist about the impact of light rail. You could have TOD or transit supportive outcomes using bus or BRT because we have some of them now, it is the discussion we used to have on the TOD Taskforce, the TOD Task Force got itself bogged down because the Minister and the Department wanted TOD outcomes, what they were thinking of, they wanted to build something, whereas a lot of what we were talking about was transit supportive outcomes. (Rowe: 7.21)

[We need to be careful of LRT elitism. You can have Bus or BRT TOD, we have it now. The State wanted to build something; we were talking about transit supportive outcomes. WR 7.21]

The Evolving Land Use Objective

To what extent was land use an issue in that submission? If you had to rank the order – first issue was ability to deliver early works – post GFC – Secondly was CB, the whole idea of CB, probably Nation Building [NB] was more the reason that the project had national significance because it changed the city, the city economic drivers, talked about the knowledge precinct, the change in demography, and employment. We tied the CB to the NB because NB was one of the criteria that IA were looking for. they didn't want projects that did not exist in a wider strategic plan, they wanted a wider strategic planning context, which they could then tie to a national agenda.... The GCRT was part of several policy documents. The CB opportunities were really obvious, so it was not the top but the second thing down the priority list (Boersma 9.1)

[The project had national significance was because it changed the city. City Building was tied to Nation Building because that was what the Governments was looking for. AB 9.1]

And when we talk to the Feds about CB what are we actually saying? ... it was mostly around change in the employment landscape, the knowledge precinct, which meant that

your economy was moving away from predominantly construction tourism to health and high tech economy, the Nation Building was ... The Land Use component, we spoke a lot about the oppy for regeneration in the 800 metre corridor a lot of .. A lot of buildings but a lot of plots not being used .. and the GCRT enabled that to happen. (Boersma 9.2)

[The Federal Government interest was about a change towards land use and economic regeneration. AB 9.2]

Being totally honest I think I have some concerns for the future of the project ITO the drop off in the CB, I think it was right up there when we had the money from IA, there was a drive to get CB outcomes, and I thought that was an inspired decision to get CB outcomes. (Grennan 13.18)

[When we had the money from IA, there was a drive to get CB outcomes, and I thought that was an inspired decision. PG 13.18]

... look at the French. They are putting in a tram. They will start at the edge of the city. An area of service industry? Well that must go, cannot have big service industry on the tram route so they will regenerate that. That is where the new hospital and office park are going. They would not think of doing the light rail project without redeveloping along it. Their cities are older than ours, but that is how they would decide their routes. In some ways, where are people moving? where do they want to move? It is probably going to end up in the middle of town because most cities are that shape, and so the routes they are going to take are the ones with the best business and potential for regeneration. (Deutscher: 3.35, 3.36)

[French light rail route planning is focussed significantly on the opportunities for urban regeneration and redevelopment with penetration into the centre. KD 3.35, 3.36]

Well I think it is something that developed along the years. If you look at all those trams in Europe, a city like Amsterdam, this is like years, decades and decades of transformation, I mean the trams were introduced late nineteenth century, twentieth century, so that is part of the evolution of the city. It was not something that actually happened ... (Kozlowski: 10.6)

[The European experience shows many decades of corridor transformation and evolution. MK 10.6]

How did the community understand that it was about city transformation and land? My view was that the project did not understand that until after we had done the consultation so when we were doing the consultation, it was not until we mobilised the business taskforce and we got the federal dollars and we really got the push for future stages, how are you going to fund them how are you going to do the land use? We have never had that consultation with the community about those concepts because they came once we had a project route... (Carroll: 8.1)

[The project did not understand the city transformation and land use objectives until after the consultation, the mobilisation of the business community, the federal money and the push for future stages. AC 8.1]

In terms of the land use planning process, is that at all evident at that stage? Not at all... on reflection we never had those conversations, because we also never had a property team then... When we did our first round of consultation in March 07... we had two people working on it... and then after our first round of consultation our property team grew, but our property response was very traditional, “we are acquiring land”, *so this is for the purposes of*, for the purpose of ... *not for the wider?* No not at all, so we started to bring that expertise in, over this 2008 period, and the thinking started to grow around it... (Carroll: 8.6).

[Initially the projects property focus was about land acquisition for the corridor. The wider land use thinking in the project on this occurs over the 2008 period. AC 8.6]

We started thinking about the public realm a little late, we did not have enough traction around this to facilitate the delivery so a lot of this is left to other players, particularly Council but the basics are right, the mode is right the stations are in the right locations, it is a fully segregated system in terms of its operations, it has its own running way, its own signals yet at the same time it will have other areas where the potential mix with pedestrians, so it has the right ingredients in there but it is only the start. Unfortunately the culture of modern light rail did not really exist in the project environment so it has been a big learning curve for a lot of people, and now they are on-board and maybe we look back on the project and find that there were things we could have done better but all the basics are right (Chang 11.24).

[The public realm thinking came late. The mode and station locations are right but the project lacked a modern light rail culture so it has been on learning curve to get everyone on board. MC 11.24]

... initially the project had a very narrow gauge, a narrow focus. If you look at Translink’s objectives at that stage they just wanted to check the feasibility of the concept, the project in that corridor and that is just about bums of seats, not necessarily the broader benefits. So it took about 12 to 18 months before we really got that movement, the Chamber [of Commerce] focus... the regional outcomes, a catalyst for change in the city and started to bring in all the other threads that were critical, otherwise it was all just bums on seats, and to some degree it still is, I mean if you go to Treasury they are interested in what it is going to cost and what they are going to get back, not necessarily the knock on benefits (Seymour Smith: 16.5).

[Translink had a very narrow focus on the project feasibility in that corridor. It was 12 to 18 months before there was a focus on the project as a catalyst for change in the city. LSS 16.5]

In terms of the concept of TOD is that resonating at all as a higher level concept in the project? It is something that is coming on more, as the project had more certainty it was being taken more seriously, we started to look at the opportunities that would come from it. We picked up the feasibility study that Parsons Brinckerhoff had done and picked up the line that they had drawn ... it did not really then go in and say how do we change the land use in the area, so it is coming on, it was not necessarily right there upfront from the beginning, and maybe that was just the way that the project was being led at that stage, it was being led very much down a technical bent, it was very much about BRT versus LRT and the pros and cons of the mode as opposed to the pros and cons of the system. (Seymour Smith: 16.7)

[The land use opportunity was not initially evident, the discussion was more technical. As the project becomes certain and issues are resolved then the land issues develop. LSS 16.7]

People also need to understand... public transport systems don't develop like that they take generations and I get frustrated, everybody raves about we should have a public transport system like Hong Kong, well yea if we had eighteen million in our city and had been around for four hundred years then that is probably a fair thing to say... The transport system has to grow as we grow, so this first system is a bit of a beach head. We are putting a stake in the sand and actually creating a starting point for something that should be bigger and probably will be (Molhoek: 14.18).

[Public transport systems, such as in Hong Kong, take generations to develop and they have to grow with the city, so as the city grows so too will the transit system. RM 14.18]

I think the land use component has been more of an evolutionary thing rather than something that was recognised immediately. Probably, what was the focus of our attention was that we knew that the centres Southport, Surfers and Broadbeach would hit gridlock at some time, and so for probably five years that was driving force for the project rather than changing the land use patterns (Power: 4.10).

[The land use component was not recognised immediately, it was an evolutionary thing. The need to deal with traffic gridlock in key centre initially drove the project. DP 4.10]

It was not till about three to four years ago that people really start to talk about increased values, renewal, revitalisation, that the business community in particular, started to really grasp the extent of it (Power: 4.23).

[The business community have only started to understand the land use opportunities within in the last few years. DP 4.23]

How significant is that decision to try and run through the centre of Southport, or Surfers Paradise? That's where you have really got to understand what people really did not get about land use... When people think of land use in our consultation process they think of how to reduce the impact on the land because they think of the construction. It is really

hard to envision, for the average person, it is the here and now. So any consultation about infrastructure projects... 'it is going to hurt me'... It was about where people go and what they are doing and getting people through Scarborough Street in an active walk up catchment. We then knew about the approvals and the forty stories and the master plans were going to give us the best future opportunities to bring people into that corridor. (Carroll: 8.15)

[The public's understanding of the land issues was about constructions impacts. They are focussed on the here and now and that the project will hurt them. Later on there was an understanding about the future development opportunities in Southport. AC 8.15]

Realising the Development Opportunities

So what is missing in that equation then? We only look at patronage to support LR and there are other ways to generate the funding needed to get LR out of the starting blocks, the lack of acknowledgement that LR leads to an increase in land values leads to lack of utilisation of LVC as a funding mechanism for FS. Unless something changes, Stage Two will happen and there will be certain property developers and owners who will get a wind fall out of the government investment, I am all for people making money out of infrastructure but the government needs to get its fair share, there are so many things that we can do but we are not there. (Grennan 13.17)

[What was missing was that we were only looking at patronage to generate funding. Light rail leads to an increase in land values. Property developers may get the windfall instead of the project because the government is not there. PG 13.17]

The land development opportunities would compensate more for the initial cost of the LRT but they are very rarely taken into account. Light rail is certainly more expensive but again, early on we were trying to get away from that and say that this is about city building, city image, things that you cannot put a dollar value on. There is a dollar value there but you cannot pin it down. So were trying to pitch that the whole way along, it was more than just a transport project (Bitzios: 2.23).

[Land development opportunities are seen as compensating for the higher LRT costs but rarely taken into account. The 2004 Feasibility Report focus was on city building, city image and intangibles over and above transport objective. DB 2.23]

I am still not sure that council on the right path with the planning documents for it, my personal opinion is that the whole of the route should be removed and placed under a separate act, if it is operated under the normal process.... till we have party politics, it will not achieve its destiny because there is too much politics involved, and there is too much parochial thinking (Power: 4.24).

[There was concern that route will not realise its potential because of parochial politics and planning policy constraints, hence need for separate authority. DP 4.24]

If the budget is just for the roll out of the infrastructure it will typically result in sub optimal decisions because the Terms of Reference of the project is about bums on seats and getting from A-B. If the TOR can usefully include the development potential of the adjacent land then either through owning it or taxing it, then the drivers to produce something closer to the Integrated Regional Transport outcomes are in the project itself. If you don't have that you have the objective of getting it but it is not a driver, the driver is making sure that you deliver the infrastructure. *In effect ... the incidental benefits?* Yes... the additional benefits and you can say quite clearly this is about adding value to mixed use precincts up and down the train line or light rail line and it is incidental... The project finishes when the train line opens and then it is up to other people to maximise the potential (Papageorgiou: 6.27).

[If the Terms of Reference include potential development of adjacent land then the project can realise the higher integrated regional transport objectives but if the budget is too narrow, i.e. patronage oriented, then the opportunities are not realised by the project, but by others. MP 6.27]

When Feds came on Board what was the focus, LVC seems to be an important issue for them. It was, more than we thought it would be, we certainly thought that the early works would be FEDS MORE CONCERNED WITH THE LONGER TERM AGENDA, IT WAS ABOUT CB but it was about the equity needs to be met, the arguments around the knowledge precinct and regeneration did not catch them as much as we thought they would ... They were all over the residual sites and whether we could redevelop the sites in a way that we could capture the value and pump the money back into the funds (Boersma 9.3)

[The Feds were concerned with the long term agenda, the land development opportunities from the residual sites. AB 9.3]

there is a choice of alignment, you could be pretty cynical as a government, could take a route that goes smack, bang through the centre of some pretty awesome parcels of land, say you can buy the whole parcels rather than trying to miss parcels of land, that enables you to purchase that land and develop it... create great locations around stations. Another thing you could do is include potential funders in the [alignment] selection really early on because the Feds really showed that they take an interest in that in the future so the idea of looking at equity opportunities that early on is something that is new, just looking at equity oppy's in PT is something that .. even the Treasury guys could see the benefits of what the Feds were trying to do, the idea that PT is a profitable exercise because it takes people to where you want them to be so they buy in stores that you want them to buy in so you can rent the sites to storeowners, people can see the commercial benefits of that but it was just not possible for that stage, too much of that was fixed in stone. (Boersma 9.8)

[Even Treasury could see the longer term benefits of land development, with the right alignment and development tools it could have been very profitable. AB 9.8]

I am an interventionist, I would like to put the corridor in the hands of the Urban Land Authority, maybe if we had started from scratch we would have a better model, I would like to invite them in, *is that for land acquisition purposes?* Yes, I would like to give them the opportunities that we are not going to be able to mine as well as what we should. ... I mean the Sydney Rocks Authority when it was established was given the vacant government land to fund itself and trade around the place and I reckon it has done a remarkable job in the last 20 years so I think that is a problem for us, a really difficult one for us to break through because if we were actually able to purchase some key dirt through there it would put us in a much stronger position of influence with some long term land use outcomes along there, and provide other opportunities for demonstration as well (Rowe 7.17).

[Examples from other cities underpin a preference for a Land Development Authority model so that the long term planning and development potential of the corridor can be realised. WR 7.17]

The GCRT Value for Money Business Case framework is about bums on seats, it does not count incidentals, is that a risk for you? Yes it is because, if you think of the good examples, Japan comes to mind now, obviously great density so a different equation, but as I understand it, many of their TODs were developed by a corporation that owned the railway line, owned the commercial, owned the property development and so a good result overall but what was performance indicator, was it bums on seats or the or number of people using the station, or was it the development return achieved by having a good service to these parcels of land? (Papageorgiou: 6.26).

[Japan example where the owners of the rail line also develop the property. Focus on performance indicators that go beyond patronage. MP 6.26]

Transit versus Driving – the Need for Cultural Change

I can remember the sort of public consultations that occurred and the contentious issues were reduction of car parking provision... that was a difficult issue to understand. The possibility of forcing of people off private cars to other public transport that was seen really negatively. It was more desired as a choice, not as, not having a car park and not being able to drive and the roads are too congested to actually drive. The desired response was that as a growing city we want efficient and capricious roads and public transport choices as well. So that was what the high level strategic approach was (Papageorgiou: 6.9).

[There was community concern around the loss of driving and parking access. The policy response sought to provide balance between car and public transport choice. MP 6.9]

If we are ever to break the culture of car use in the Gold Coast, not everywhere, clearly people who live in Upper Coomera are not concerned about the benefits of higher density and if people want to take their car to the supermarket to load up than that is a sensible way to do it so I would not expect much of that. But a lot of the journeys that people make light rail and public transport on the coastal corridor; I think it will be very successful (Grose: 1.40).

[There is no expectation of a change to car use in the outer suburbs but on the high density coastal corridor a lot of journeys will go onto the light rail. RG 1.40]

Brisbane has a strong public transport culture, the trams since 1920's to 1960's, it has the heavy rail, it has the City Cats, the bus. Everybody in the city mostly uses public transport. There is a public transport, same as Sydney, same as Melbourne. The Gold Coast is built around the car ... here people still love their cars and I think that one of our biggest challenges is to change that thinking. (Kozlowski: 10.18)

[Other cities have strong public transport culture but Gold Coast is built around the car, the challenge is to change that thinking. MK 10.18]

But I think you have to go into it with a sense that driving your car around and being able to come and go as you please is a privilege and there is price that you pay, (Molhoek: 14.14).

[Driving convenience is a privilege and comes at a price. RM 14.14]

Another key component is car parking, ... having less car parking..., uses to encourage greater take up of public transport and instead for all sorts of reasons, some of them cultural, some of them commercial, we have pressure to actually have additional car parking put into the mix, and that becomes... it is quite erratic from project to project. I think there has been quite a lot of conflict there and that comes back to that Gold Coast example where I said there was strong support in a strategic sense for land use planning integration and getting mixed use and high densities, but on a case by case approval the traditional concerns came into play... (Papageorgiou: 6.22).

[Objective of reduced car parking as part of higher level integrated planning solution is in conflict with community concerns. MP 6.22]

Well I was always of the view that Council was responsible for creating the car parks, and I thought that that was Council's role, but did not think that we should be going any further with the funding. I felt that was the limit of the Council's responsibility (Baildon: 5.15).

[Council has responsibilities for [public] car parking but there are funding limits. GB 5.15]

I think that the other thing is that we should not under estimate the car parking demands from people who will drive to that system, for whatever reasons... I don't see a parking

strategy in and around those stations, formal or informal, so people drive to that station. Where will they park and if they are going to park there all day what impact does that have on local businesses close to the station? ... So should we be looking at park and rides next to a major bus hub, put people on a bus and take them to the light rail? There is no thought to that and certainly by nature they take up pretty big areas of land and there is no planning acquisition or siting for those things. (Case: 12.19)

[We should not under estimate the demand for parking. Without a parking strategy there may be negative impacts on local business near stations. Park and ride for LRT will have significant land impacts, so should consider car parking at major bus hubs. BC 12.19]

I mean I have this view about the corridor that we are going to be able to say to Councillors in relation to parking policy, "in this corridor, this is a one billion dollar investment, we have to do this"... and so I see it as a stalking horse to provide us with a different typology of development than what we have advocated elsewhere in the city... (Rowe: 7.24)

[Project is a 'stalking horse' to revise parking policy as part of a wider development approach in the corridor, different to that advocated elsewhere in the city. WR 7.24]

There has been a culture for some quite some time about car access as equalling land value and you are shifting that culture to being public transport value equals access equals greater land value. I think it is something that everyone struggled with through that process... (Bitzios: 2.44)

[Everyone has struggled with a change in culture and thinking about the relationship between land value and shift from car access to public transport access. DB 2.44]

When the client and the architect sit down they talk to marketing people and so on, and still the thing for residential is that they have got to have car spaces, in a lot of cases they say we need more, less for the commercial and more for the residential. So there is still this mindset that you have to have a car and maybe that will change when the system is in place. *Is this even on the corridor?* Is it even on the corridor? Yes. (Brooke 2.45)

[Car parking is important in new development, but maybe a change after light rail. SB 2.45]

There is always going to be trade-offs. People like cars, people like to stay in their cars, it's hard to get people out of their cars, that is all they have had for the last 20 – 30 years, and for their whole life they have been a car dominated person... We also have to look at a changing generation that is more socially conscious so we are seeing a trend away from car dominance and that is why you do need these other options. (Seymour Smith: 16.17)

[Car culture is entrenched but there is generational change so the trend is moving away from car dominance so we need other transport options. LSS 16.17]

Realising a Transit Oriented Lifestyle

There was a lot of scepticism but the financial side of it was well known and because the states, IRTP many billions \$ shortfall of what the State should be doing.. (Grose 1.4)

There was a lot of scepticism about the financial side of the project (RG 1.4)

Well, the hope is also that having nodes of development with places where people can live, and work and shop and have recreation close by, the transit becomes irrelevant to them and becomes something... contained.. Very short trips by elevators or walking to get from home to office to the shops, the cinema and you can do it all without any car or transport use (Grose: 1.19).

[The development pattern is about an accessible lifestyle, not just about transit. RG 1.19]

We will have stations that are places where there are multiple activities, where people will play, work, there will be a feeling of safety, there will be the benefits of densification, of having people close to the facilities that they want, the carbon emissions will be different, the form of the city will completely change, it will be hard to grasp what it will be like, I think it will happen very quickly (Grennan: 13.14).

[Station places will be dense, active places providing for work and social benefits with improved environmental benefits but this change will be hard for people to grasp. PG13.14]

If the station is a public space you will get the outcomes, the frontages, not necessarily even catching a tram but just sitting, reading a newspaper, especially stations like the one in Southport or Surfers Paradise, they are the meeting places where people congregate in the city, they are a few of the examples that have been done in Strasbourg and Amsterdam. I saw a tram station that was absolutely adjacent to a vegetable shop the guy had the stalls outside and you stepped of the tram right into that shop and I thought 'oh my god', this is fantastic, there was a coffee shop on the other side, there were no barriers (Kozlowski: 10.17).

[Station places will be permeable, accessible, social and attractive for people to congregate. MK 10.17]

All of the social outcomes and all of the responsibilities that you have to provide a great place to live for people so you have got to look at it through the eyes of 'are you contributing to a cleaner environment?' (Molhoek: 14.15).

[Need to look at LRT environment and ask how we are contributing to a cleaner environment. RM 14.15]

I think it still needs to be a desirable place to live, near the attractors. Just building development around the rail station, and that's a TOD, and we have high density there, to me is the opposite to what you want, not just because it is on a heavy rail line from Brisbane, and what are we encouraging there; longer distance commuting and satellite city? A TOD is better to be anchored close to the beach, shopping, recreations (Brooke: 2.50).

[TOD is not just about being at the station. It needs to be a desirable place to live, near attractors such as the beach, shopping, recreation. SB 2.50]

Well there was a lot of concern and statements at the time about the image being sort of grid locked with traffic because at the stage we have the highway through Surfers Paradise was split, and we had three lanes of relatively fast moving traffic moving through the centre of Surfers Paradise and I think some people may have twigged, "was that a good thing?" and was it the way they wanted to see the city in the future... I think some people did think about that, and there was an image but was that the image that they wanted for Surfers? (Grose: 1.10).

[Concern that the image for Surfers Paradise was about traffic and gridlock, and that this was not consistent with the desired image for Surfers in the future. RG 1.10]

A tourist city and tourists in particular will be interested in that mode...., it is an image issue and a fun issue and a novelty issue.... because tourists will use it... because they are high generators (Papageorgiou: 6.30).

[Light rail image will be attractive to tourists with a perception of fun and novelty. MP 6.30]

This Project is one of those that I will sit back on thirty or forty years' time and be pretty satisfied. It will not only alter land use of the city, but also alter the perceptions about the Gold Coast... I think this will go a long way to change our credibility at national level so long as long as people capitalise on it (Power: 4.25).

[Light rail will alter the land use and the perceptions of the city and potentially the credibility of the city at a national level. DP 4.25]

You often think of TODs like that – priority transit corridors [KD draws diagram of options - Priority transit corridors] it is about lining things up along this corridor and activities along the corridor - You don't want to take the car to any of those places, you have your ticket, you Go Card and you just make the trips don't you, so it's a different lifestyle about access to opportunity, and that's what the GCLR, so many things, not just bars and restaurants and beaches, but universities and hospitals lined up along the corridor, places of work, so theoretically could rip out LRT and put something else in and it would probably do the job, it is just that in the end icing on the cake – choice of LR system is that it fits in so well to those environments (Deutscher 3.15)

[It is about the system connecting up those places you want to go to, it's about a different lifestyle, about access to opportunity KD 3.15]

ITO walking, protecting the walkability of that environment, is that also important? Yea. Absolutely that was one of the reasons why got behind the City Greening program [abbrev] again the way that was presents was that we need shade, right type of trees, part of long term solution around PT was to have access ways – ways of getting there without expiring, makes sense to have better environment to live in. (Molhoek 14.17)

[Improved walkability with trees and shade is an important with public transport. RM 14.17]

Section Two - The Transit Planning Structure and Process Enabling TOD

Institutional Enablers

I am fairly certain that the IRTP was well and truly informed by us, because we had started working on the state government... But there was no doubt at all that we had sowed the seed between that period of 1994 and 1996, without a doubt.... *And is that in relation to the light rail or does it go beyond that?* Probably beyond that... the land use plan actually, as well as a lot of the IRTP actually developed out of Councils asking the State Government for that type of overarching planning process, so by and large they picked up work of the Councils and overlayed it, there was not much innovation or variation from what individual Council's had within their own planning. The great thing was that we had three good local government ministers in a row, Tom Burns, Di Macaulay and Terry Mackenroth, so we had ministers that understood what Council's did, and they also understood that we could no longer continue with five to seven year planning horizons that we had been using or the fact that there was no such thing as the IRTP (Power: 4.8, 4.9).

[The IRTP was 'well and truly' informed by Council, much of the planning policy was actually done by Council. We also had the benefit of ministers that understood what Council did and the need for longer planning horizons. DP 4.8, 4.9]

In a lot of areas I think that this Council... is significantly ahead of where the State Government is at in some of these areas and I think we have also shown over the past little while that we are actually not afraid to enter the debate and lead some of that debate. ... I sat on the TOD taskforce... and it has been criticised for not having produced a great deal and one of the reasons why is because the State Government itself really had difficulty in understanding the importance of the relationship, how to bust through some of the structural impediments and financial impediments that they had (Rowe: 7.8).

[Council is ahead of the State in many areas and not afraid to enter and lead the debate. In relation to TOD the State are caught up in the structural and financial impediments to TOD. WR 7.8]

... so that actually created the framework for a consistent framework that would encourage, densification, consolidation, mixed use and multiple choices in terms of transport options, so there was sort of overarching policy, *so this is the Regional Framework for Growth Management?* The RFGM yes, integrated and discussed and ... for some time, and the statutory regional plan which then had a series of DRO's that exactly aligned with that sort of thinking about densification, mixed use, public transport and transport choice. So there

was no real conflict in a policy sense, and it was not, did not address conflicts in a funding sense because we were not up to that yet (Papageorgiou: 6.7).

[RFGM framework encouraged density, consolidation, mixed use and transport choice and exactly aligned with Council's thinking about the transport objective. MP 6.7]

The City Transport Plan was the first local integrated plan in Queensland which quickly followed the IRTP and that was the first time that was done in Queensland. Prior to that all the other Gold Coast transport studies that were done, and there was a report that was done every two to three years, by Department of Main Roads. Ninety per cent of that was road based. This was the first time where it was integrated, it was actually one consolidated document that covered road, public transport, walking (Brooke: 2.6).

[The City Transport Plan was the first integrated plan and followed the IRTP. Previously the transport planning was done every two to three years by Main Roads Department and was ninety per cent road based. SB 2.6]

The [City Transport Plan] report was brought forward to council. It was a joint project by GCCC with the State and it was a thirty year CTP for the city of Gold Coast. ...I just embraced the project immediately, I had had briefings previously on it and I thought it was just a wonderful project for the future of our city. *And In terms of support within the community?* Let me say first that the Council adopted the plan without dissent, unanimously and every time it was put to Council it was carried unanimously, every time (Baildon 5.2, 5.3).

[The CTP was a thirty year plan, and contained the light rail project. Council adopted the plan unanimously and it was carried unanimously every time it was put to Council. GB 5.2, 5.3]

The shift that I can recall was that the Councils certainly felt that they had proposed a desirable framework for the region that the State had embraced it and became more enthusiastic over time and that eventually led the Council's statutory regional plan that the Councils wanted for a long time, so there was a sense of a real partnership and I think it was in a sense, the economy was growing, was very positive, and it was a sense that all these things are achievable (Papageorgiou: 6.13).

[Council felt that they had proposed a desirable framework for the region and it was embraced by the State and this led to Council's statutory regional plan. There was a positive view of the partnership and a sense that things could be achieved. MP 6.13]

At the State level there had been the RFGM and IRTP, were they influential for Council? Well I don't know what was the contribution was from the State at the time because that was done at officer level but at the political level I felt that there was.. 'ho hum – stick it in the drawer'. It was great publicity while we did the launch but we are not really interested in that anymore, we will move onto something else (Baildon: 5.10).

[Following the light rail launch [1998] there was a view that the State were not being serious about progressing the project. GB 5.10]

... If Council could support or address some of those issues... and was prepared to put some money in to it, then you would probably get the State Government to fund the project because it is one of their own policies... I think a lot of the SEQRP infrastructure planning perhaps is reasonably well advanced but the capacity to fund it and to make the commitments to fund the infrastructure is not... (Case: 12.6)

[The planning for SEQRP infrastructure planning is well advanced but funding is not. If Council could support the project and put money in then would probably get the State to fund the project. BC 12.6]

I still think in terms of the drivers for land use change, it is sitting predominantly with Council and it certainly was when I was there, it has evolved a little bit more. (Seymour Smith: 16.4)

[Council were driving the land use change. LSS 16.4]

Structure of Council: Professional Collaboration

I inherited a structure when I arrived here that was set up by Doug Daines, and Doug was one of those magnificent thinkers who recognised that in this city transport was important, and that it was going to be a fundamental part of the success of the city going forward and where was it best located? It was best located within a planning directorate that was able to synergise the strategy development and looked to integrate the variety of strategies that were needed for the city and part of which, getting embedded and promulgated through the planning scheme. So that was, back then in 1995/94 that was some very progressive thinking. I don't think people realise exactly what he had done, because the transport and the transport planning function normally sat in the capital works area of Council, so pulling it out and recognising it as a strategic policy area and linking and embedding in the land use policy area has really been the strength, and it is interesting that that relationship has not changed at all, so that was the first thing, and I think we actually got it right, You can restructure local government in a thousand different ways so that was something that we actually got right. (Rowe: 7.5, 7.6)

[Transport planning was best located within the planning directorate and part of the strategic policy area, rather than the capital works area. Linking land use and transport policy has been a strength for Council. WR 7.5, 7.6]

A pure transport objective is logistical, move X people from A to B ... Back up the tree the true integrated transport planner... how we move the people is secondary to where we have to move and the lifestyle they are expecting to have... (Deutscher: 3.19).

[The pure transport objective is different from integrated transport planning where the movement of people is secondary to the issue of the destination and the lifestyle. KD 3.19]

Council was probably divided. You could walk through Council and there are competing visions. More people can see the problems, people look at the issues and the problems ... can't look forward.... A lot of the strategic planners seemed to be keen, the planners probably doing the development assessment, they saw problems, and the Engineering Services area probably saw this as an intrusion of road space, and probably quite resistant to the idea (Brooke: 2.41, 2.42).

[Council was probably divided with competing visions amongst the wider professional groups in development assessment and engineering. SB 2.41, 2.42]

you could actually look to a structural solution in the state that actually combines things, a range of functions that actually exist in TTA , QTMR and the Planning functions – DIP, there was a terrific oppy there when the planning functions sat with the infrastr coordination functions but it was never .. realised, on occasions you could see some real glimpses of it but it was never realised, and I am not a structuralist by nature but if a structure falls out of it – good, I think the State govt, partic in this area, I would actually advocate a structural response to break those cycles of inactivity,

[There are opportunities to combine functions in the State Government but they have not been realised. WR 7.9]

And are there professional silos that need to be ... Yea and they are captured by disciplines as well, so not just a policy silo but also a discipline silo, which is one of the problems with any bureaucracy, but again , there is a lot wrong with LG but there is a lot right with LG, and it is that immediacy, if you can actually align a couple of people in the organisation you can actually align, jumps, so if you can get a Director and a CEO singing the same hymn you actually don't need the Councillors. (Rowe: 7.10).

[One of the problems of bureaucracy is discipline silos and policy silo's. WR 7.10]

It was more driven by the fellows in the transport planning area of Council... the Chief Transport Engineer of the time ... Rod Grose... he was very enthusiastic about it... I believe that they were the ones that drove it; there was another fellow that did a lot of work on it... Steve Brooke it was, Steve did a heck of a lot of work on it (Baildon: 5.8).

[Transport planning area drove the project.GB 5.8]

I think the engineers [within transport planning] were more far excited than the planners, the planners were more, to fair to them, more focussed on producing the new planning scheme and dealing with the enormous growth that we were experiencing at the time but, economic development, the Special Planning Branch, were particularly keen on it, probably

because they were allowed to deal outside the square... all of those guys recognised that it was a catalyst to change the form and the function of the city. I don't think that engineers in Engineering Services were particularly happy because it affected their roads (Power: 4.4).

[Council had different views about the project: Transport planning were more excited that the planners. Economic Development recognised that it was a catalyst to change the form and function of the city. Engineering Services were unhappy because it affected their roads. DP 4.4].

By tradition the engineers will try and build something efficient in the construction and operation which has a very limited focus on the product that they are trying to deliver and the land use planners will have a much more holistic approach to that and probably because of time constraints, budget constraints in the way the project is delivered, the voice of the land use and the planners was pretty low in the design development stage, probably made the hard yards up to the feasibility and deciding that was the way to go forward (Chang: 11.10).

[Engineers traditionally focus on efficiency in construction and operation whilst the planners will have a holistic approach but because of time and budget constraints they were not heard in the design development stage, not until the feasibility phase. MC 11.10]

Who, in the time leading into the CDIMP, who is running the show, which professional groups? In the beginning it was the urban designer. They would put these beautiful urban designs and we would be in the middle of consultation and later understand that they didn't work because there was no interface with the engineering profession... Over time we got a better balance, but at the time it was very much the urban designers. ... We went out with a Scarborough Street that could not be done because the two professions could not sit with each other and do it collaboratively (Carroll: 8.4).

[In the beginning of the CDIMP phase the urban designers were leading the project but there was no interface with the engineers. Over time we got a better balance. AC 8.4]

So in relation to the RASL, how would you describe the level of influence of planners and designers compared to engineers and transport planners? I think the approach was an integrated one. Everyone was involved in the process, there were engineers there were urban designers, architects, planners (Case: 12.17).

[In relation to the RASL it was an integrated approach; engineers, urban designers, architects, planners. BC 12.17]

Do you see any tensions within the project around resolving the transport planning objective versus the land use objective? You always have those tensions within the project and it is useful to have those tensions. You can't lose sight of the transport benefits but as we have often discussed when you are talking about people then it is difficult to differentiate

between a mode where you are moving people around and where they want to go so light rail in that sort of system is inextricably linked. What we have probably learnt from other projects in SEQ is that it has not been planned that way, a lot of transport projects have been planned on the basis of getting a corridor transport solution and then hoping that land use will infill around it and as you know that is not occurring on the heavy rail network and it is not occurring on the busways (Poole: 15.9).

[You always have professional tensions between land use and transport planning in a project and they are useful. You cannot lose sight of the transport benefits but the SEQ heavy rail and busway projects have not achieved land development outcomes. TP 15.9]

If you look at the profession now, and you even see this with Main Roads panels requiring transport planners to be Bachelor Urban and Regional Planning qualified, so first of all you need strategic planning, you have got to be a strategic thinker, you have got to be trained to think strategically which engineers are often trained to solve problems but then engineers that can think strategically... Secondly, you are trained in land use... principles in urban planning, you come into it from another angle don't you... come in at different angle, what's the secret to TOD and regeneration? ... Integrated planning concept... almost as much land use as it is transport infrastructure (Deutscher: 3.7).

[Firstly you need to have strategic planning and thinking and then you have the principles in urban planning. It is about an integrated planning concept, as much about land use as it is about transport infrastructure. KD 3.7]

We were part of PET so not there just to look at transport, but there to also look at land use... There was a lot of collaboration there and a lot of time spent identifying issues (Brooke: 2.11, 2.14).

[As part of PET we needed to look at both transport and land use, there was a lot of collaboration there. SB 2.11, 2.14]

... does this collaboration improve? It did, the biggest learning was that you had to have everyone in a room, in an office on the Gold Coast. Hassell worked somewhere, GHD worked somewhere, the project worked somewhere. It was too fractured so you never got a one voice approach; you never had a discipline leader that went across all the disciplines. ...We then started to understand and learn that you needed to bring to the communications team the engineering and the urban design and lay that over the corridor so we could then give you the feedback. So if that is your plan then this is what the stakeholders have been telling us. We then had the transport modellers lob in on it, which was MWH, but at that stage you also had a person, a skill set in Leon Seymour Smith (Carroll: 8.5).

[The collaboration improved once we learnt to get everyone in the room together to get a one voice approach. AC 8.5]

It is always hard to know who should come along first. Should the planners dictate how the transit system should be rolled out, or whether the engineers tell the planners that this is the best location from a constructability point of view and how they might want to plan the city around that. I am not sure if there is a right answer. ... You are never going to see eye to eye in that space, for the better part if you can get the parties together at the same time you can tick most of the boxes but it is hard. I think the salesmanship probably comes from the planners, and the can do, it comes from the engineers, and we have to have a can do attitude, and you have got to be able to provide some technical traction to it, it has got to be built. The knowledge has to be available so you can get, you have got to be able to build it with whatever the budget is (Case: 12.4, 12.5).

[It is difficult to know who is on top; planners or engineers? You are never going to see eye to eye in that space but if you can get the parties together at the same time you can tick most of the boxes. BC 12.4, 12.5]

... so I immediately became involved in that and became conscious that there was integrated transport planning being done across the southern area of SEQROC and it was not just about roads it was also about transit and the idea of a light rail was already there, and was already being considered. So fairly early on in I was gathering work for a new planning scheme. The existence of the light rail as a proposal was something that I was immediately aware of and took into account (Papageorgiou: 6.4).

[The early integrated transport planning response by local government focused on transit and light rail and this was taken into account in the land use planning area. MP 6.4]

The Gold Coast was growing quite rapidly and there was a lot of development activity and this planning work that was being rolled out for ... the new planning scheme for an integrated city and as I mentioned earlier being done by teams in the same division working geographically in the same.. in close proximity, sharing the research documents for the transport and the new planning scheme. There was not from the outset, any division. There was certainly not a debate between transport planning and land use planning about a desired future for the Gold Coast, there was actually quite closely alignment. *And – what I am getting from that is a sense of collaborative approach – yep, you say that it was a very high level of collaboration?* I'd say it was a very high level of collaboration because what I was getting to was, it is not like we were competing agencies for funding for priority dollars, it was very much , the transport components of the planning scheme were drafted and reviewed and submitted by the transport planning team and it was done in the context, we were together representing Gold Coast on regional and sub-regional forums and it was in the context of both the regional plan and the SEQRP as well and the framework for growth management. (Papageorgiou: 6.6, 6.7)

[The planning work being done by teams working in close proximity and sharing the research documents so there was close alignment and a high level of collaboration. MP 6.6, 6.7]

Yes, certainly a collaboration. A lot of it was about where was development going to happen in the future, and where would stations be in the future. (Grose: 1.33)

[Collaboration focus on future development and associated station locations. RG 1.33]

I found the [GCCC/GCRT]Reference Group very fruitful and quite beneficial because we probably tackled all the major issues that relate to urban design and we talked about placemaking techniques and stations so they are located for place making , about the impact of the light rail on surrounding development so definitely found the Reference Group very fruitful, beneficial. One thing is that a lot of our recommendations were not carried forward or implemented, regarding the station location. I think that, surprisingly the hospital station, *you are talking about the GCUH station right?* yes, the hospital station... this station was a subterranean station, and that was against our principles of the light rail, the principle was to integrate into the urban environment. Putting it underground was not integrating it, especially in this site, there was no need to put it underground (Kozlowski: 10.2, 10.3).

[Council's Reference Group was very fruitful and beneficial and was focused on placemaking and urban design around the stations but some outcomes (such as the underground hospital) station were against the urban design principles. MK 10.2, 10.3]

It wasn't till about probably... about 2003 that they [development industry] started to help us to lobby the state government, started to be on board to be part of it (Power: 4.14).

[After 2003 the development industry helped Council to lobby the State for light rail. DP 4.14]

... what I signed up for was being the protector of the community, make sure that the engineers and urban designers did not get away with themselves and their ideas, and that they did not create something that they thought was great because it worked on a piece of paper and for them it looked really great when award time came around, that is what I signed to go "none of you live here, none of understand any of this, you won't use it at the end of the day, and the people that will, that will take it through to the end need a seat at the table, so I signed up for a fight. (Carroll: 8.3)

[Need to defend the community interests and to make sure that the engineers and the urban designers are held to account for their decisions. AC 8.3]

... but think about this, we had a Mayor that was elected opposing light rail and he was re-elected still opposing light rail. On any vote that we took to Council we never got anything than 100 per cent support for whatever it was; the funding package, the route. Now there

are a number of reasons for that as well but it shows what an administration that is actually energised and aligned can achieve (Rowe: 7.11).

[Administration aligned and energised so even though the Mayor was elected and re-elected opposing the light rail the Council always gave 100 per cent support. WR 7.11]

It was not until the engagement with the community, until there was material starting to be produced about how does this thing fit, is it feasible, that you started seeing all the others coming in to create a project. So it went from a design to a project, because we started bringing in land use, we started bringing in that whole review around community, some of the economic benefits, and started looking at that change, and that started bringing on some of the support groups and support functions. That whole communication beyond the project, which was the first 12 to 18 months it was just the project, it sat within Queensland Transport, within Translink Transit Authority (Seymour Smith: 16.20).

[Wider engagement with the community was part of transition process from design to project and in this we start to look at land use, community and economic benefits. LSS 16.20]

Having a balance with planning and engineering coming together that looks at 'oh it only works there because this is how wide the corridor is' and then going a bit broader and saying that we need to break some eggs and make this thing work instead of that treading softly. We get too much treading softly, that you can't have an impact, that no one will want the project and it will go away. (Seymour Smith: 16.22)

[Planning and engineering coming together leads to more questioning of the route decisions and building the confidence to make bolder decisions for a better project. LSS 16.22]

Balancing Land Use and Transit Objectives

The tensions that exist, there are, just as there are tensions in a policy area like the conservation and environmental area, there will always be those tensions and I actually think that that is a really good thing, and again though, provided that those tensions are moderated within the context of looking at integrated outcomes I don't see that as a significant problem. I think there are more opportunities with how we have got ourselves positioned now to harmonise and modernise those tensions to get integrated outcomes. I am actually quite bullish and excited about what we can do in this space in the next five years (Rowe: 7.7).

[The professional tensions are always there and that is a really good thing provided that they are moderated within the context of an integrated outcome. WR 7.7]

... So where you do get conflict is around "that is too hard, too expensive" which was... the GC rail line put in the bush, because they did not want to go into the middle of town, because it is all too hard, people complain about the noise and stuff. There are plenty of examples of LRT systems that have been put into freight corridors, because they could but

in the end they have gone back and redeveloped along that corridor and it has probably turned out ok. That was the transit system shaping the city, nothing wrong with that but all too often it is easy, “we could do that, we could not do that”, we took the course of least resistance so we did not quite get to the town centre, because that last mile was too expensive. So the train station ended up on the edge of the town, plenty of examples were you see that ... That’s a problem with the thinking, that’s not a problem with the land use or the transit. (Deutscher: 3.21)

[Conflict in RASL decision making process about easy, cheap, edge alignment such as the Gold Coast heavy rail line versus going to the centre. It is not a problem with the land use or the transit but with the thinking. KD 3.21]

At the time the discussion was about integrating transport and land use. We talked about the five hundred metre radius and maximising the exposure of the people to transport choice. Most of the planning, and we did quite a few of the Local Area Plans at the same time, was about how do you bring the transport right into the... mix,... it was how about we bring it right down the middle, right through it. (Papageorgiou: 6.19)

[Local Area Planning focus was on walk up area to stations, maximising the catchment, having the transit through the middle of the urban environment. MP 6.19, 6.20, 6.21]

So then, ... going through the debate around the alignment, the land use really came into play, ... the debate going around the centres, taking the easy way, the engineering way versus the land use transformation potential... *And how vigorous is that debate of one option over another, a transport planning option over a land use option?* It was pretty heated, yea, I think there were pretty heated debates and the frameworks we had to assess, alignment options, they all came pretty close, so it was something would make it tip one way rather than the other but maybe the framework was not particularly adapted to what we wanted to achieve, maybe skewed one way more than the other. The parameters maybe should not have been weighed the way that they were but I think we ended up with the right decision (Chang: 11.5, 11.6)

[The land use came into play in the debate over alignment options, the easy way versus the land use transformation potential. The framework was not adapted to what we wanted to achieve with land use but we ended up with the right decision. MC 11.5, 11.6]

Is this a transport project or a LU project? I think it is one of perception, for me it was a land use project, it was always about the city, think the winning bidders, they said it was about the city, they got it.... I think when you get the pressures of meeting the financial hurdles and you need to get more and more definition around the scope in order to price it properly for PPP Co, to get bids as accurately as possible you narrow that, the nice to haves become can’t haves through that integrated bid process, and so if you just look at the scope of the project then someone could argue that it is now just a transport project, but because the

bidders seem to recognise the need for this to fit into the city and recognise that , they are not taking patronage risk, well put it this way, hopefully the incentive was strong enough to see the need to integrate this into the city in a way that drives patronage up and then drives revenue up so they see as more than just a PT project, I think on balance most people see it as something that is all about LU, devt andthe growth of the city, maybe that is being completely naive but that is what I believe. (Boersma 9.9)

[This was always a land use project, always about the city, the bidders got that but if you look at the scope of the project then you could argue that it was just a transport project AB 9.9]

And effectively that is a land use led decision rather than a TP led decision – do you see any tensions within the project around resolving the TP objective v the LU objective? You always have those tensions within the project and it is useful to have those tensions, you can't lose sight of the transport benefits but as we have often discussed when you are talking about people then it is different to differentiate between a mode where you are moving people around and where they want to go so light rail in that sort of system is inextricable linked. What we have probably learnt from other projects in SEQ is that it has not been planned that way, a lot of transport projects have been planned on the basis of getting a corridor transport solution and then hoping that light rail will infill around it. And as you know that is not occurring on the HR network and it is not occurring on the busways. (Poole 15.9)

[There has always been tensions between the land use and transport planning objectives and it is useful to have them, what we have learnt is that a lot of SEQ projects have been planned assuming land use will happen later but that is not occurring TP 15.9]

Section Three - Enabling TOD - Mode and System Characteristics

1995 – 2005 The answer is light rail

It was before amalgamation, we invited people from Portland, city planners came over to address Albert Shire, and at that stage we were looking at the light rail potential for Coomera and for Helensvale but also Nerang to Broadbeach..... Even before we had the very first committee meeting it was already discussed in the background between Councillors and the officers... We weren't predetermined in our outcome but we already had a pretty good idea, we had come to grips after twelve months of being amalgamated that the coastal strip would be an ideal place to start (Power: 4.1).

[The light rail potential was recognised prior to Council amalgamation [1995] and carried over into the new amalgamated Council. DP 4.1]

Light rail. I was convinced that it should be light rail, based on evidence that Rod Grose gave me... but I did look at everything and I did read up because there are articles on the internet... in fact I can remember the second in charge of Queensland Transport, I think he was just recently retired, and he was vehemently opposed to the LRT, so... certainly split opinions *And in relation to what your heard what appealed regarding the LRT?* Well the fact that it carried over two hundred people and that would take at least one hundred and probably one hundred and fifty cars of the road. On top of that, from an environmental point of view any pollution created was at another source, where the power was created, it did not have a direct impact in the city, so it reduced impact in the city. *So that leads to issues of amenity?* Yes, for all of those issues, it is clean and green and quiet and those were major issues for the project. (Baildon: 5.14)

[There was a firm belief that it should be light rail but there were different views in Queensland Transport. The appeal was the light rail vehicle capacity so that it took many cars off the road and the environmental benefits for the city. GB 5.14]

The City Transport Plan was premised on a more sustainable transport system. To demonstrate how that was to be achieved and to send a message that things were going to be different it was launched always as a light rail project because transport planning knowledge was pretty clear that this was the appropriate mode. Don't forget in 1998 we had not opened the busway, we did not know what it would look like, but I still think it was the right decision ... the busway would not have fitted in where the light rail was going (Deutscher: 3.2).

[City Transport Plan premised on a sustainable transport system. It was clear from a transport planning view that light rail was the appropriate mode for the corridor. In hindsight the decision was right; the busway would not have fit the corridor. KD 3.2]

My view is that it was pushed from the Gold Coast end and ignored at the Brisbane end, particularly after busways started operating in Brisbane and being expanded with the South East Busway. I think the State Government people in Queensland Transport did not want to know much about light rail, they made their decisions, along with Brisbane City Council about how to move large numbers of people and it was not trams or light rail. Brisbane is a busway city and that was about the end of it (Grose: 1.14).

[Gold Coast advocacy for light rail was at odds with Brisbane position on the busways. Queensland Transport and Brisbane City Council position on busways was about moving large numbers of people. RG 1.14]

I said to someone the other day, the answer was always light rail, and very early in the piece we adopted the, whenever anyone asked, whatever the question was it was always light rail, and I don't care how much but it has to be light rail and for me there was no other reason that intuitively but also pragmatically I was aware of the differences that such a mode as light rail can bring to the city and I have seen it around the world and was confident enough that that was the answer, but that actually was the answer and if we did not get light rail the answer would be lesser, and in some cases significantly lesser. So when we got to that stage when the State was on board, and we had to do that, it was a really interesting time for us and in the end what was doubly interesting was that our intuition was found to be correct once the blow torch had been put to it (Rowe: 7.18).

[The answer was always light rail. The experience from observing light rail systems around the world confirms that. Not getting light rail meant something lesser, maybe significantly lesser. That intuition was put to the blow torch and found to be correct. WR 7.18]

Light rail was appropriate to the Gold Coast because it already had, in some of those locations, the density and the mixed uses that were compatible to a transit oriented corridor and the nodes. So there was a strong argument to say that Broadbeach, Surfers Paradise and Southport had sufficient density and mix to really benefit from that sort of infrastructure (Papageorgiou: 6.18).

[Light rail was appropriate for the Gold Coast as it had the existing density and mix of uses compatible to a transit oriented corridor and the nodes. MP 6.18]

I mean it is interesting we have had this evolving discussion with the Councillors and there have been some seminal parts of that journey of discussion with them where they have actually been very brave. I mean the introduction of the transport levy. And it is interesting too that many of those seminal moments with the Councillors have also been about the light rail, I mean the light rail is that catalyst for investment or that catalyst for discussion... But the project itself, light rail, has been such a common thread around that discussion (Rowe 7.4).

[The light rail has been the catalyst and the common thread in the evolving discussion around the key investment issues and many of the seminal moments with Councillors. WR 7.4]

Debating the Mode Options

You don't do public transport just to get people from A to B, that is not the end, it is the means to an end, and the end is really to regenerate the city and all the land development opportunities, all the benefits that you get, that is why you build a project like the GCRT and that is why you build light rail because it has all these iconic features, people identify with it and it becomes part of the city.... (Boersma: 9.6)

[The GCRT is a means to an end; the end is to regenerate the city. AB 9.6]

I can be a bit agnostic about the mode because the primary decision is a lifestyle decision (Deutscher: 3.15).

[Lifestyle is the primary decision, not the mode. KD 3.15]

I don't think it matters which mode it is providing there is good legibility and good access to whatever the form is (Case: 12.15).

[Does not matter which mode as long as good legibility and access is provided. BC 12.15]

It is fair to say that Council, Council officers and Councillors, guided by the Council officers have also preferred light rail in preference to a bus system (Grose: 1.22).

[Council officers and Councillors have preferred light rail over bus. RG 1.22]

In Brisbane, it has lost totally its integration of land use and transport planning, I mean the way that the BRT has been done in Brisbane is not something that I would recommend, it is functional, it functions very well but its integration with land use, I would give it 1/10, *When you say that it functions well you mean how it functions as a transport system?* Yes, I often use the busways to go from the city to UQ, [University of Queensland] the last time when I went with my wife I said to her, '80 per cent of the time I don't know where I am, under tunnels over tunnels', you don't know where you are and you lose touch with the city, but this is the way that they have planned it, maybe Bogota and Curitiba are better integrated, maybe that is the way that it is done, in terms of permanency ... (Kozlowski: 10.10).

[Brisbane BRT is functional but is not integrated with other land uses. Passengers don't know where they are and lose touch with the city. MK 10.10]

With the mode and the land use issue, and I refer to the role of the development industry, do they have a preference? I can't remember if they did when we met with them. No, because they didn't have a preference, at the time we just wanted a project, there were so many

layers of this project that we had to get through, a mode, a route, funds. When you look back, it has taken five years, it was not normal, so no they didn't (Carroll: 8.13).

[Development industry, at time of the CDIMP, did not have a preference for mode. AC 8.13]

I think probably the features, the vehicles can have the same dimensions, the same level of comfort, the stations can be pretty much the same. I think the difference is that one is completely permanent because it has tracks in the ground and it is by nature a closed system. A BRT system can be open any time to other buses which in some ways is good because you can service greater areas... and in other ways it detracts from the purpose because of travel times because when you start introducing random vehicles in the system it puts all that reliability out the window if you are not careful. In terms of cost, infrastructure they came surprisingly close which could have been a surprise to some of our masters, surprisingly close because we were aiming for a high quality BRT system if we were going down that path (Chang: 11.12).

[The BRT and LRT vehicles and stations are similar. The difference is permanency and whether the system is open or closed. BRT systems can be open to other buses, enabling a greater service area but a loss of travel time reliability. MC 11.12]

When we were talking about the closed BRT system is this a tenuous concept? I think so, purely from a bus operations point of view there would be far greater efficiencies to be able to run off. It is very difficult to see how it would stack up as a closed system (Bitzios: 2.31, 2.32).

[Closed BRT system is a tenuous concept as an open bus system means far greater efficiencies. It is very difficult to see how project would stack up as a closed system. DB 2.31]

The BRT concept was a closed BRT concept, how viable do you think that this, (note the Brisbane busway) It is very different but once again the issue was that they integrated with the road network, the super buses, the articulated and bi articulated buses, were just not able to. So what that meant was that they were a closed system and running from one end to the other because of the issues you had taking them beyond the corridor, and so that has had an impact on the benefits that you get, when you compare it with a busway, and they run all the way to the city, you lose that continuity, you have a multiple seat journey. That said, even looking at the busway now where they are looking at concepts on the South East busway where you get more of a spine based service a-la the Gold Coast LRT concept with buses to the stations as opposed to running all the way into the city and that is a capacity issue so segregated infrastructure means that you can sort of get away with that because you have full segregation of the infrastructure you don't get caught up in the traffic lights, you can push a lot more capacity through the system (Seymour Smith: 16.10).

[The super buses are not able to integrate into the road network so you have a closed system. The open system has capacity issues so looking at closed spine based system concept for South East Busway that allows a lot more capacity through the system. LSS 16.10]

You touched on the issue of the mode before and how the project were required to land either a BRT or LRT option, how would you describe that process, firstly within the community and secondly within the project? I thought it was there was so much debate, I thought there was really good data, I was really proud of how genuine the project, the work that Tim [Poole] led. It was very difficult because Council had an on the record preference for light rail and yet there was a genuine evaluation and to get a good outcome, not to dress it up as a fait de compli (Carroll: 8:11).

[There was really good data, so much debate and a genuine evaluation. It was very difficult because Council had a preference for LRT. AC 8.11]

I felt that in accepting buses that was all we deserved as a city, 'we are not big enough or good enough to have a world class public transport service, a fixed service, something that might cost a bit of money'. I felt that we were doing ourselves out of something that as a city we deserved and I also felt that it was part of our coming of age as a city, to have a fixed rail whether it was a fixed rail or a light rail and to have a robust public transport system. Symbolically it says that we are a growing city, 'this is important, we are evolving, this is the next step in our journey' (Molhoek: 14.16).

[The symbolism of accepting buses conveys the message that the city is not good enough to have a world class public transport service. The city deserved light rail, it was part of the city's coming of age. RM 14.16]

LRT and land use costs

In that work that you are doing around the property, to what extent is that influencing the mode, you were saying that LR would give you a better outcome from a property perspective, does that feed into the business case? It did in a sense in that we had two sets of costs, one for LR and one for BRT, and while LR had a greater physical impact for land, it had a greater requirement for land, the actually amount that we had to pay was amazingly similar so while it didn't mean that the business case had two dramatically set of costs, in terms of land acquisition the residual land aspect was very different, there was a better residual land outcome for LR over BRT. My understanding was that our business case was one of, we had the only business case ever. In Qld, that had consideration of residual land in the business case itself, normally you would have the overall land costs, what it cost us to buy the land, in our case we actually had the land costs less the residual land, so there was a net land cost. *So that is selling the land that is not required for the project.* Yes so at the end of the project we would have left over land. I don't think we had a big say, a big influence in

the overall elements. My feeling is that I was a bit disappointed in the level of buy-in that we had in the hierarchy in terms of Land Value Capture and land use around stations (Grennan: 13.4).

[In terms of land acquisition the residual land aspect was very different, there was a better residual land outcome for LR over BRT and the net land costs were considered in the business case which was a first for Queensland. PG 13.4]

So the City Building stuff is mainly after the Business case and CDIMP has been finalised, so effectively, I am getting from you that the land use stuff was quite narrowly focussed (Yes) and it was not particularly influential in the mode or the corridor. No. I think that we were lucky that there were some people that pushed hard for the right mode, the right corridor, the right station locations, we had that CB/TOD outlook, but from the Property Teams point of view we did not have a strong level of input. What I will say is when we got the Federal Government funding from Infrastructure Australia, the day that happened, that changed everything and LVC and CB became much more important, and I think that is a very good thing (Grennan: 13.6).

[The Land Value Capture and City Building became more important later after the Federal Government involvement, after the mode, corridor and stations were decided. PG 13.6]

Image of the Mode

As soon as you put in a bus system you have got the diesel exhaust... low capacities so successions of vehicles therefore the need to give them greater priority with greater separation versus light rail which has a much bigger capacity per vehicle unit, grouping of units together, is relatively very quiet, runs on electricity ... so the light rail is a friendly and attractive sort of system... (Grose: 1.22)

[Image contest of large numbers of low capacity, diesel exhaust buses in a segregated corridor versus the high capacity, quieter, cleaner 'friendly and attractive' light rail. RG 1.22]

People saw the congestion issues with trams which is more about the way that the road network is set up so you have got a lot of strip shop areas with the tram in the middle, having that right of way so people are dodging ... so that was probably one area, and the other area that people were vocal about was the overhead wires and what they look like and the pollution of the air, so that is where people are coming from so ... these tiny clunky vehicles and with these overhead wires at intersections... Those who were against it would pick out the overhead wires, the safety, these other things simply because they did not want the trains in the first place, the naysayers versus the others. (Seymour Smith: 16.10, 16.11)

[People saw congestion issues, the 'tiny clunky' vehicles, the overhead wires, the safety – simply because they did not want the trains in the first place. LSS 16.10, 16.11]

Like Q1 were very keen for the light rail, they wanted stations out the front. On the other hand Australia Fair would do anything to get rid of the bus, so they see the social difference between people who use light rail and people who use the bus, a greater mix of social types. *So does that overlap into the image associated with each of the modes?* Yes, unfortunately it does. (Brooke: 2.22)

[People see a social difference between bus and LRT, Bus has social stigma associated with it. SB 2.22]

In the business case assessments, as that progressed, two separate business cases, one for the LRT and one for the BRT, as it progressed the bus system seemed to continue to look more and more like a LRT system, they were trying to guide it, to extend it, almost building a light rail system with a motor and tyres. To me it was probably a good indication of where it should be going. (Brooke: 2.25)

[As the Business Case assessment of the mode progresses the BRT aligns visually to look like the LRT. It indicated the preference for the LRT image. SB 2.25]

In relation to the city image I think Council's vision for the project probably did emerge from the CTP... The GCRT project was as much for a transport system as it was for the city as an attractive place to be. So there was always a city vision element to the project, that probably got stronger as the GCRT was established so I think that there was a wish by half of the decision makers to demonstrate change that things were going to be different that they could be different and would look good and the image of the light rail fit with that very nicely, a sign post that we are doing things differently. (Deutscher: 3.9)

[Council's vision for the project emerges from the CTP. GCRT was as much for transport as it was for the image of an attractive city, that vision probably got stronger as the project becomes established. The light rail fit that image. KD 3.9]

And so that image issue comes up in different ways, was the actual light rail image an issue in itself? It was but for me it was an issue further down the track. For me it was a selling point to the others that I used, particularly the types of vehicles that we saw from Germany and French, is it Rouen? Particularly their vehicles. That had a very powerful impact when we were trying to pull the others across the line. For me it only became an issue later on when we realised that it would actually have an impact on our tourism image. (Power: 4.16)

[The image of the European vehicles had a very powerful impact on selling the project. This later became an issue tied to the city's tourism image. DP 4.16]

That image issue, how strong is that? On the Gold Coast, very, particularly from the likes of the Chambers and the likes of those who want to grow a new image for the city and can see something as sophisticated as this type of technology. But others... only a certain type or class or person catches public transport and that is associated with the bus. So... when you

say to people 'what do you think it should look like' the word that comes up is 'sexy', and so they have a real image association with it, very much. (Carroll: 8.12)

[Mode image is significant, especially for business. Light rail tied to a new 'sexy' image for the city as opposed to the bus which is stigmatised by a view that only certain types or classes of people use it. AC 8.12]

One of my issues with the bus was always going to be all those buses running through the pristine beach environment between Surfers and Broadbeach that really does not work for tourism. (Molhoek; 14.15)

[The bus image conflicts with the desired tourism image in Surfers and Broadbeach. RM 14.15]

In the imagery of the project they looked similar, the vehicles looked similar the stations looked similar. The other day there was an article about the extensions of the light rail and the vehicle in it was the bus... (Chang: 11.11)

[Bus and light rail vehicles and stations look very similar and are even mistaken. MC 11.11]

I will put my architects hat on here, buses are functional, they function very well,... But one thing about buses is that they are out of scale in the central area... If you are doing transport which will consider connecting with outer suburbs like Nerang, Worongary, Upper Coomera, definitely buses, but the central part of the city whether it is Gold Coast or Brisbane, or Adelaide, Melbourne. Trams are a mode that integrates much better than a bus. You have got heaps of good examples of trams in Europe, and they have got very good integration with pedestrians, with the surrounding uses, you cannot picture that with a bus... Also, the fact that the tram is sexy, so there is the aesthetic. So there is three things, there is scale, image and aesthetics in the central city... (Kozlowski: 10.7, 10.9)

[Buses function very well in the outer suburbs but light rail has the scale, the integration with pedestrian and the aesthetic appropriate for the central city areas. MK 10.7, 10.9]

I don't think it was a big issue within the project team, it was more an issue for the community and politically, to have something that looked good, I think that what is more important is the permanency, for the light rail, for the developers, once you have got rails in the ground you know it is not going to change for twenty or thirty years and that is the sort of certainty that developers need to be able to develop around there or even for people to buy land or mode their business close to light rail, image is always nice, it is a bonus to have something that looks good but I don't think that was something that the project team ranked strongly in the decision making.[Poole: 15.10]

[Image is nice but it was more of an issue for the community and politically, not for the project team. The permanency is more important, the certainty that developers need to develop around. TP 15.10]

Mode Flexibility and Permanency in the Urban Environment

The approach with the mode analysis was to look at the whole of life costs associated with each of the modes and then to look to see if the difference could be made up or compensated for by the other benefits that light rail could provide over BRT and one of the benefits was the issue around the confidence of the permanency of the light rail and its ability to provide long term mass transit capacity was one of the things that would attract new businesses to an area and it would allow reliable planning around nodes and that was one of the qualitative factors that we had identified would have a strong value. (Poole 15.6)

[LRT cost difference offset by confidence of permanency and long term mass transit capacity attracting new business and allow reliable planning. TP 15.6]

The issue of the image of the mode tends to come up, how significant do you think that issue is? We knew the LRT had the versatility to work in range of environments that we needed it to and yet have the pulling power of a fixed track system. As I said, back then, we didn't have a busway and the case could be mounted that the nature of busways gives similar effect to land use change... Of course it is not going away, it is always a concern with buses. Even so I think that busway would have been the wrong answer. We're not really into BRT as a catalyst for change and urban renewal and intensification. So the versatility of the light rail speed, also pedestrian mall environment, mixed traffic it is possibly the most versatile form of rail. (Deutscher: 3.3)

[LRT has the versatility to work in a range of environments with the speed and ability to run in a pedestrian mall environment and mixed traffic. KD 3.3]

One of the advantages of the bus, also one of its key disadvantages is in its flexibility. One of the early bits of research, in that corridor it is visitor usage and the advantage of light rail with visitor usage is that you can see where the track is going to end ... whereas even if it is a bus running in a bus corridor it may at some stage get off and that is enough to tip you over. (Bitzios: 2.29)

[In that corridor there is the issue of visitor usage and legibility of the route so the flexibility of the mode, the lack of legibility, is a disadvantage for the bus. DB 2.29]

The busways provide a cheaper solution than a railway to move large numbers of people, they do provide fixed infrastructure so it gets around the problem of trying to say the light rail has a fixed corridor and the buses are flexible and can be moved around. If you have spent millions of dollars building a busway, you are not going to start shifting it from the

South East Freeway corridor to Logan Road because it would work better there, after a couple of years. If you are just putting paint on the road to mark bus lanes maybe that would be the case. *The argument tends to be that buses are flexible but in fact the busways are not flexible?* Busways are not flexible, and not only are they not flexible; they are very, very rigid to the exclusion of other things, to the exclusion of pedestrian movements and so on. (Grose: 1.15, 1.16)

[The busways provides a cheaper solution than a railway to move large numbers of people. The route is fixed, they are not flexible, actually very rigid to the exclusion of pedestrian movement. RG 1.15, 1.16]

How important was the mode in achieving what we wanted for the city? Critical... too damn easy to remove services so there was a permanency about it that attracted me. (Power: 4.15)

[Concern to have a permanency with the mode. DP 4.15]

So what is the issue of the light rail versus the bus? Well it provides certainty to development. I am no expert but the few reports that I did read and the few international people that I got to speak to, provide us with briefings, and my own observations, I came to understand that if you want to encourage more effective development and better land use practices then you have got to have a reliable public transport system that people can depend on and in all of the studies that I was introduced to the general theme is buses just don't cut it... Business people in particular, there is a reluctance to get on a bus because there is a sense that buses are very ad hoc and never you want know where they are going to go and if you get on the wrong number you are up the creek, but a fixed rail, when you have travelled it a few times you know where it is going to go, there are not as many numbered options, it is a simpler form to use and another thing is that it is not a stop start. So if you want to get your lap top out and do some work or to sit quietly and relax there is not the sense of being jostled around like a passenger in a vehicle and so there is a whole lot of dynamics come into play around that (Molhoek: 14.11)

[Light rail provides certainty to development. Effective development and better land use practices associated with a reliable and dependable public transport system and 'buses just don't cut it'. RM 14.11]

There is a lot of flexibility with the bus service, you can move it, you can change it, you can spread its network... you can't necessarily do that with light rail, with the same amount of flexibility, but what the light rail does do is bring a form of public transport that is accepted by people, is safe, and sexy, is efficient moves a lot of people quickly. If you want to talk about changing urban form I think light rail provides the mechanism to do that much more than a bus and I say that because there is some degree of certainty with light rail and its stations, there is some clarity around how it operates. So how does that affect urban form?

Well if I was going to invest in business or shop or newsagent or high density living and knew the light rail was there and I know because it is going to be there in ten years time so I am making a sound investment with the infrastructure that is in place. (Case: 12.12)

[Bus flexibility has benefits but light rail is accepted, safe, sexy and efficient. In relation to changing urban form then light rail does that better than the bus because there is certainty with light rail and its stations. BC 12.12]

There were some people were quite supportive of the bus thought it was a cheaper option and it probably is if you are looking at short term investment and having a focus on the transport solution, probably has its supporters. There were the people who were absolutely sure that it was going to be light rail and it was clear in their mind, and it was about the permanence of the rail in particular and the strong message that it sends. It is a very strong decision, a very bold decision and I think some people in Council were absolutely determined that it was the right mode. (Chang: 11.7)

[People supporting the bus thought it was cheaper and it probably is as a short term transport solution. For the light rail supporters it was about the permanence of the rail and the strong message that it send. MC 11.7]

There is one report that was done by Council for the full CDIMP that was about land use, *Chapter Five?*, yes, and what drove anything about land use was the evaluation around the modes... the only reason it got in there was to say that these were the unquantifiable benefits of light rail over bus because of the permanency of the corridor, and until you got a mode decision you did not know what you could or could not do with land. So we got a mode decision in ... September 08, so once you got that... December 08 we put the IA [Infrastructure Australia] submission which is where we first started to understand, ... the picture was starting to take shape, we then had the ability to say, well if that is what we have available to us then what does it lead to and the IA submission forced us to understand the economic benefits, what was it doing, and that is when a lot of the dots came together and we were then able to start to push forward with the land use concepts. (Carroll: 8.6)

[The land use issue was driven by the mode. The key issue was the unquantifiable benefits of light rail over the bus because of the permanency of the corridor. Once the mode was resolved the project started to understand the land use and the economic benefits. AC 8.6]

Centre versus the Edge

At the time the discussion was about integrating transport and land use. We talked about the five hundred metre radius and maximising the exposure of the people to transport choice. Most of the planning, and we did quite a few of the Local Area Plans at the same time, was about how do you bring the transport right into the... mix,... it was how about we bring it right down the middle, right through it. (Papageorgiou: 6.19)

[Local Area Planning focus was on walk up area to stations, maximising the catchment, having the transit through the middle of the urban environment. MP 6.19]

If you are really going to maximise the benefit of the system, in terms of getting people to where they want to go to and to penetrate into dense part of cities you need a vehicle that is manoeuvrable and accessible and acceptable in the city environment. (Grose: 1.27)

[To maximise the benefits of the system you need a vehicle that can penetrate the dense part of the city, that is manoeuvrable, accessible and acceptable in the city. RG 1.27]

I think the journey we took, the justification of LRT over BRT, the government and the community had started to get it. Our first real test of the design of the system, the integration with light rail was the making the tough decision about going through the centre of Southport rather than on the edge and that is where we introduced the notion to the community that this is about taking people to where they want to go, and Council planning in the heart of Southport around very dense land use, and this was a way of activating that, and I think that is when, certainly within the project team and to a lesser extent within the community, started to understand that this was being designed as part of the future of the city and then when it came to justifying why light rail instead of BRT it started to become easier. (Poole; 15.7)

[The first real design test was whether to go through the centre or the edge of Southport. That is where we introduced the notion to the community that this is about taking people to where they want to go and the activation of the land use. TP 15.7]

LRT can run on fixed track, it's quite, it is non-polluting, at the source anyway, you can run it through a pedestrian mall, and there are plenty examples of that, you can have cars running in the corridor. (Brooke: 2.36)

[LRT is fixed, quite, clean, pedestrian friendly and mixes with cars. SB 2.36]

You don't want to take the car to any of those places, you just make the trips don't you, so it's a different lifestyle, about access and opportunity, and that's what the Gold Coast Light Rail is, so many things. Bars and restaurants and beaches, universities lined up along the corridor, places of work. So theoretically you could rip out the LRT and put something else in and it would probably do the job. In the end it's the icing on the cake, the choice of light rail system is that it fits in so well into those environments. (Deutscher: 3.15)

[It is about the place, not the mode; you could have a different mode. The place matters and you don't want to take the car to those places. The light rail system is 'the icing on the cake', in that it fits in so well into those environments. KD 3.15]

If that money argument had gone the other way, can you see BRT running down Scarborough Street? I can, but it is the lesser by a long way to get the sort of land use

outcomes. That is why, whatever the question, the answer was light rail. Why? Not for the people moving aspects, but what it meant to the city in terms of future redevelopment, development of the city. Again this was never about the transport, although that was originally important, it was always about the value add to the city long term and the buses would not cut it. ...*the route and stations would be different with BRT?* Possibly yes possibly... but I was amazed by the sorts of technology and I think it would have meant a rethink not just of location but design, you know there would be significant design implications. (Rowe: 7.20)

[Could have had BRT running down Scarborough Street but a lesser outcome by a long way to get the land use outcomes there. It is about value add and the buses would not cut it. Possibly another route with BRT, possible another design. WR 7.20]

The Brisbane busway is a permanent piece of infrastructure that has not had the same land use potential? It perhaps suffers from the same thing as the heavy rail. It has parked itself right beside the South East Freeway so it does not have a walkable catchment. It is a drive oriented solution to transport planning and its purpose is to get cars off the South East Freeway, it's probably done that fairly well. (Case: 12.13)

[Brisbane busway has a similar problem to the [Gold Coast] heavy rail as it does not have a walkable catchment and favours driving. BC 12.13]

The Mode as a Catalyst for Change

I think it was good territory to put the transit in because don't forget the construction of the rapid transit still has big impacts on the surface; Heart of the City Scheme, removal of the couplet, really driven by Gary Baidon's vision, and really a good demonstration that light rail was coming. Surfers was completely reconfigured, the creation of Surfers Paradise Boulevard from what was previously a six lane couplet, was a big demonstration that things really were changing in a different way from the moment that was announced the Chevron Renaissance project emerged. Surfers was on the way. (Deutscher: 3.10)

[Surfers Paradise Boulevard, previously a six lane couplet, it was good territory for the transit. It was a demonstration that things really were changing. KD 3.10]

So often people talk about TOD's in other cities where they might have a railway station where they would like to build a TOD around it or wait for the development to happen. We have heaps of development happening with no shortage of developments or redevelopments and density through that corridor but it was the transit part that was lacking. (Grose: 1.18)

[TOD concept is normally a station waiting for development. Gold Coast has the development but not the transit. RG 1.18]

You have busways in Brisbane, and they have been in place for a while, the South East Busway was 96/97 but then you talk about what sort of development activities have happened around that, there is nothing. It is very much a drive to the station or the bus coming into it... So the mode allowed the project to rethink: was the infrastructure going to be integrated with the community? That then bought on the potential for the surrounding land use as well. So I think the mode was very important. (Leon Seymour Smith: 16.8)

[Brisbane South East Busway has not realised development. The mode debate enabled the project to rethink the issue of integration and land use, so the mode is very important. LSS 16.8]

It is probably going to have, on a micro scale, probably a much bigger impact than the busway. It is integrated into the existing community and hopefully it will influence the next community and the one after that (Case: 12.14)

[Light rail will probably have a much bigger impact than the busway, it is integrated into the community and will influence the next community. BC 12.14]

... we knew there would be significant growth and development within I think at least 400 metres of the tram line itself, and I was very enthusiastic about that as the project was coming through mostly older developed areas and Southport etc. So there was a great opportunity for high densities to be created and the figures have also shown that business does increase when the line gets established. (Baildon: 5.11)

[We knew that there would be significant growth and development in the walk up area to the station. There was great opportunity for higher densities and increased business, especially in the mostly older developed areas and Southport. GB 5.11] Note KD3.3

More specifically, the real estate anchor has been the beach and that is where the high values are, from Surfers Paradise to Broadbeach, that will always be the case, with or without LRT. (Bitzios: 2.49)

[The beach, from Surfers to Broadbeach, is the real estate anchor, the high value area. That will always be the case with or without LRT. DB 2.49]

I don't think there has been a lot of thought about route and TODs that might emerge on the new bus routes with increased frequencies and the infrastructure that should be in place to support that. (Case: 12.19)

[Not a lot of thought about the TODs that might emerge with the increased frequencies and new infrastructure on new bus routes. BC 12.19]

It was very interesting when we started dealing with people like Sunland, Raptis and Niecon, in particular, being the three big companies that understood the three key centres along the

route, because it was their bread and butter. They were not committed immediately to light rail, but they were passionate about rapid transit of some form, because they immediately understood the ramifications of it... Smaller developers were quite supportive but did not understand the intensity of the change that would occur, and I don't think that they understand the speed once it is operational. (Power: 4.14)

[The three big developers on the route were not immediately committed to light rail but they were passionate about rapid transit and understood the ramifications of it. Smaller developers were supportive but did not understand the intensity or the speed of change once it was operational. DP 4.14]

Connecting the mode to a higher level vision

And embedded within that document was the light rail project, the genesis of a mass transit system on the Gold Coast, and so that is where that was born, and it was born out of a general discussion about what was the big thing that the city needs to be able to reshape the future and respond to the future... Those of us on this side of the fence always saw it as more than a transport plan, but nevertheless it was conceived ostensibly as a transport project... but it was the Trojan horse; this was going to change the city fundamentally... So is that land use/city building element, *is that an evolving theme in the project?* It was always there... It was around that interconnectedness of the land use of the city with not just the transport but a variety of other policy areas, the environment, the social, etc. But the transport/land use one, in this city has been the pot of gold... (Rowe: 7.2, 7.3)

[LRT was more than a transport project; it was the Trojan horse that would fundamentally change the city. It was about a range of policy areas but it was the transport/land use relationship that was the pot of gold. WR 7.2, 7.3]

When I first came to Council I was pretty ambivalent about the project because I didn't know a lot about transport, did not know a lot about planning. I was directed to reread the old transport study and I was most fascinated that as far back as late 1997 the Council was having the discussion, was talking about the significance of this sort of project and I think even back then they were supporting a light rail system along with a whole raft of recommendations about car parking requirements regarding new developments and encouraging a lesser dependence of car use ... so when they started to talk about the importance of a good public transport system, being a fixed system I really got it, ... so it really just fell into place for me. (Molhoek: 14.2)

[Came into Council feeling ambivalent about the project but studied the background and saw how it tied in with new development and encouraging less dependence on the car. So when they started talking about the importance of a good public transport system I really got it, it just fell into place for me. RM 14.2]

What are they not getting? In part they are not looking far enough into the future. I have never travelled overseas much until 2000, 2002 and I was like many people, just a little bit oblivious to the challenges of the future, oblivious to how other people live, and so did not have a very mature world view. Having spent about three or four years where I was travelling regularly and relying on public transport and trundling in and out of very different cultures... So to me it seemed a logical, sensible thing for us to be doing, because we just continue to be a car oriented society, you can never build enough roads, there will never be enough space. (Molhoek: 14.4)

[People do not look far enough into the future. After three or four years' experience with travel and different cultures and relying on public transport you realise that you can never build enough roads; there is not enough space. RM 14.4]

The population just do not understand what this is going to do. They might think that they do but they don't. I know that sounds arrogant but they have no understanding. This thing will arrive and it will fundamentally change not just that corridor, the way that other corridors and centres operate. I firmly believe that if you dig me up in twenty to thirty years' time, bring me back, I reckon you will see a vastly different city, not just in a physical form but in terms of how the community itself sees the city, not just in a movement sense. (Rowe: 7.19)

[The population do not understand what this is about. This will fundamentally change the corridor and the way that other corridors and centres operate. In twenty to thirty years' time, the Gold Coast will be a vastly different city, not just the physical or the transport but in terms of the way that the community itself. WR 7.19]

And you touched on the issue of place qualities around the stations, how do you feel the level of awareness was around those sorts of opportunities? Again, very poor, I don't think that anybody, unless people had travelled, people base this on their experience. (Bitzios: 2.39)

[Unless they had travelled it would be difficult for people to understand the place opportunities. DB 2.39]

There is nothing even in Melbourne... you don't see a lot of that... unless you see it and see how well it can work and how it fits, I would say that the majority of people don't know. (Brooke: 2.40)

[Unless you see it the majority of people will not know what it is. SB 2.40]

And in terms of the perception of light rail... do you think people perceived it accurately? No, there is no doubt at all their picture of light rail were Melbourne trams, the trundling noisy old trams that we were used to or had seen in Brissy. They did not realise it was far greater capacity, far more advanced than that type of project and also faster, theoretically faster

anyway... We saw that when Ron Clarke was elected, the continued reference to trams and the complete lack of understanding And in terms of the image that you and others were promoting, how would you describe that image? We were looking at places like Portland, Germany, France, all of the then state of the art products. (Power: 4.5, 4.6)

[The perception of light rail was of the old trams in Melbourne or Brisbane. People did not realise what this was. We were looking at state of the art product in Portland, Germany and France. DP 4.5, 4.6]

And the issue of the image of the city, does that come up very often, the image of the mode? Again going back to consultation, people associated that with something foreign, imported from somewhere else, that they were a bit suspicious if that would work or not and pointed out that Gold Coast city is unique and has its own characteristics and just questioning if something from Europe or the US would work in that environment. I think the people who had travelled and were educated about what it was were generally supportive of the benefits of it but unfortunately some of the people had a limited idea of what it was, it made it really hard to convey what we were trying to achieve. (Chang: 11.9)

[People were suspicious of something foreign, from somewhere else and did not believe that it would fit with the unique nature of the Gold Coast. It was difficult to convey what we were trying to achieve unless people had travelled and were educated about it. MC 11.9]

In the issue of mode BRT and LRT it seems to me that the community did not really appreciate that there was any difference between them? Yea, ... in the imagery of the project they looked similar, the vehicles looked similar the stations looked similar. The other day there was an article about the extensions of the light rail and the vehicle in it was the bus because they looked quite similar so they did not quite appreciate that there was such a difference. (Chang: 11.11)

[The LRT and BRT imagery was similar, people did not appreciate that there was a difference. MC 11.11]

How important to you was the decision to go with light rail? I would almost say that it consumed me, there were very few things that would get angry about when I was in Council but whenever the debate on that issue was not going well and whenever people, including our current Mayor, would push the bus option or something way far short of the ultimate of this system I would get quite incensed and it would frustrate me because people didn't understand the importance of it. (Molhoek: 14.10)

[Decision to go with the LRT was very important and people's failure to understand it was frustrating. RM 14.10]

What do you think their view of the project was at that stage? Disbelief, disinterest. There is a small group that is interested and wanted to engage around getting their mode

preferences up, there were, and the disbelief is around 'you have already got a bus corridor, why are you building a light rail corridor?' One of the lessons that we have learnt is that the community did not know that they had a problem, the community did not know that the way the city was going was not sustainable and was not going to be, we could keep doing it but we would not have a bright future if we kept doing it. They were also, I suggest, uninformed. (Carroll: 8.7)

[There was disbelief and disinterest about the light rail, the community did not know they had a problem. The way the city was going was not sustainable; we would not have a bright future if we kept doing what we were doing. They were uninformed. AC 8.7]

Transit Corridor Permeability as a TOD enabler

There had already had been a fairly strong preference away from an impermeable system and that is why the Brisbane style busways had been rejected already, and so what we were presented with when we started the detailed planning was that the at grade system that was easier to get to and was part of the fabric of the city had already been locked down and that is why when we already had the BRT concept we had already got rid of the overhead monorail concept, we had got rid of any notion of tunnelling and got rid of the idea of creating any strong barriers, so philosophically that had already been determined by government and that was the work that Council and people like Rod Grose did early on. (Poole: 15.11)

[There had been a fairly strong preference away from an impermeable system. We had got rid of the idea of creating any strong barriers, that was Council's influence. TP 15.11]

The argument tends to be that buses are flexible but in fact the busways are not flexible? Busways are not flexible, and not only are they not flexible, they are very, very rigid to the exclusion of other things, to the exclusion of pedestrian movements and so on. (Grose: 1.16)

[Busways are not flexible and they are rigid to the exclusion of pedestrian movements. RG 1.16]

What was the extent to which mode was an important factor in relation to the land use objectives I think the mode is really crucial when talking about this sort of system, you really need something that is not going to replace one set of negatives with another set, we all know what happens with the... it is noisy and takes up a lot of space and you have got to segregate them from pedestrians and cyclists and they become a blight as soon as you put a bus system in you are back to the... As soon as you put in a bus system you have got the ... low capacities so successions of vehicles therefore the need to give them greater priority with greater separation versus light rail which has a much bigger capacity per vehicle unit, grouping of units together ... (Grose: 1.22)

[The mode is crucial in relation to land use. You need to not replace one set of mode negatives with another set, note the problems of noise, space, segregation, low capacities and greater separation. RG 1.22]

With the busways this [TCP and pedestrian and cycle access] has clearly been a problem and with some forms of light rail it has been a problem, has that ever come up significantly in this project? There are always the doomsayers who say that trams and bicycles don't mix because bicycle tyres are going to get caught in the tracks and how can trams possibly negotiate level crossings without ... protection for them and so on, you could say that peds and cars don't mix but after 100 years we have a reasonably good arrangement where you don't step of the kerb without looking both ways, ditto for tram line, but the busways were never going to have that because buses just didn't want pedestrians around. (Grose: 1.28)

[Doomsayers will say that trams and bicycles don't mix. We have worked out a reasonable good arrangement with cars. With busways we were never going to have a reasonable outcome because buses do not want pedestrians around. RG 1.28]

I assume that this comes into play in terms of the mode, corridor decision and the impact of transit on the urban environment? Yea, it is again about putting the transit where people want to be and where people want to use it, there is no sense putting a system that stops 10 or 15 min walk out of Southport, because people just will not walk the 10 or 15 minutes. (Grose: 1.29)

[No point in putting the transit 10 or 15 minutes away from where people want to use it. RG 1.29]

The bus corridor tends to become more segregated than the light rail corridor. Is that a factor? It was actually in our mode choice selection. One of the aspects that we used in our reporting is that a tram is on tracks and we know where it is going to go, you can walk within a metre of it and it is safe, you know where it is going to go, whereas a bus is driven by a driver – tolerances, separation that you need, less safe, may be perceived but the separations you need are greater and the little bit extra that you need makes a big difference, so there was perceived side. Permeability across the track or across the corridor, not sure why but the perception was that the light rail was more permeable than the bus based system. (Bitzios: 2.24)

[The issue of segregation was a factor in the [PB Report] mode selection. The tram has certainty and safety for pedestrians, more so than a bus which requires a higher level of segregation. Perception that light rail is more permeable than the bus. DB 2.24]

And in the end the BRT system was a closed system Once you start trying to guide buses you have other issues with kerbs and guides, note Adelaide O Bahn – all sorts of issues with people trying to cross that. (Brookes: 2.26)

[Guided buses, note the Adelaide O-Bahn, have issues with kerbs and guides, all sorts of issues with people trying to cross the corridor. SB 2.26]

Permeability? – well where it is appropriate. If running from Helensvale, through the bush it does not matter... I think once you get into a mixed traffic environment its ideal ... what is the vision, what is the interaction? ... in a mix of urban environments permeability adjusts for the urban environment. (Deutscher: 3.16)

[Permeability adjusts for a mixed traffic environment but in the bush it does not matter. KD 3.16]

I don't know if I mentioned to you about the bus lanes at Miami. It was not fault of the guys that did it but the brief was to build bus lanes, either side, and when the tram goes through that will have to be nuked and redone, that's ok, they created space. Is that the corridor width, yea – but what they did not acknowledge was that there was a big land use interaction each side of the corridor and probably set that back about ten years, prevented that interaction, so graded effectively about eight lanes of bitumen, and rationalised intersections and so you could only cross about every one kilometre maybe, which is far to far, so then they fenced it, it was broken down because they want to get through, so while I can why they did that, was in their brief, and of course the solution was totally ignorant of them. (Deutscher: 3.17)

[The brief was to build bus lanes but did not acknowledge the land use interaction either side so in building their project they compromised the land use outcome. KD 3.17]

With the transit corridor, ... seen busways in Brisbane, how much thought went into the transit corridor and the issue of permeability? Busway canyons! ... [re: LRT corridor] - I don't see that it is a problem. It is probably a generational thing, one or two generations to get used to it. It will become part of our everyday life, so crossing the tracks and the stations where it might be seen as a barrier, in the future, because it is not a massively engineered thing like the heavy rail, people would become oblivious to it, the one thing that always scared me would be an attempt to elevate it and if that had happened we would have ended up with a huge white elephant, the route itself, running down the beach front... (Power: 4.18)

[Busway canyons! versus light rail which is not a massively engineered thing, not a problem, people will get used to it; will become oblivious to it. DP 4.18]

When we went to Surfers Paradise we had one route option. They thought there were others and again there was a sense of well why would you build on the Esplanade, It is not a double edge, there is no sense of an active frontage so we talked to them about how you get an active frontage and active catchments and walk ups because that had numbers around it, from some of those in the community they started to understand, well what can I

do to make money out of that, through development, or the leaders saying what can I do to make this a great place, how can we influence the land use around it. (Carroll: 8.15)

[Option of the Esplanade versus a route with active frontages and a walk up catchment. People came to realise the development opportunities of one route option versus the other. AC 8.15]

... the important thing is that station is permeable and the station itself is a public space. If the station is a public space you will get the outcomes, the frontages. Not necessarily even catching a tram but just sitting, reading a newspaper, especially stations like the one in Southport or Surfers Paradise they are the meeting places where people congregate in the city. There are a few examples in Strasbourg and Amsterdam. I saw tram station that was absolutely adjacent to a vegetable shop the guy had the stalls outside and you stepped of the tram right into that shop and I thought oh my god this is fantastic. There was a coffee shop on the other side, there were no barriers so whereabouts was that? Amsterdam ... we talk about getting that hand in glove solution and in Europe it is just there, yea and I mean it was a car free street and the shop was here and the coffee shop here [drawing] it is critical not to segregate and to make it a public space with active frontages and people congregation, sitting. (Kozlowski: 10.17)

[Important that the station is permeable and a public space so you get the social outcomes, people using the space for meeting, congregating, reading the paper, there were no barriers. MK 10.17]

Is there a difference between BRT and LRT in relation to transit corridor permeability? Yea, i think there is the predictability aspect. Light rail is guided so you know exactly where the travel path of the light rail is and you can show it in the ground so there is .. on the bus system, even BRT, there is a human factor and they can go slightly off differently around the corner so there is that predictability issue. ... the BRT are shorter vehicles so you need a number of them to carry the same number as a LRV which means more vehicles in the corridor and less gaps to allow people to cross safely in areas, yea I think light rail is more permeable in a very dense urban environment. *So does that then raise the issue of how segregated one corridor is versus the other and how does that then impact on the route decision?* Look going back to the permeability issue, what was important was the reference project, we know light rail works in mall environments even in Australia, I think we struggled to find examples of BRT, they are just not used to going through CBD's, ... BRT could have worked along the same corridor but it would have impacted on the permeability. To some extent it did needed to be a fully segregated system to work, even with a bus. *Would it have had to be a closed system?* Yea I think that is one of the key considerations, making sure that you would not have extra vehicles added in ... you need to control as much as possible the number of vehicles in a given corridor and it's probably harder with buses. (Chang: 11.13, 11.14, 11.15)

[LRT is guided so more predictability than BRT, also fewer vehicle movements so LRT is more permeable. We struggled to find examples of BRT that would work in the same corridor as LRT. The BRT would have to be a segregated system and a closed system with a limited number of vehicles. MC 11.13, 11.14, 11.15]

The preference was for less [segregation], we wanted integration of the system as much as possible... when you look at the light rail it is a quieter system, more certainty, you could actually build right up to it to some degree, and still have that safe feeling and that is something that you need to have when you start to look at increased densities and land use around these systems. You are used to seeing the light rail systems running through malls, and having that shop front come right up to the system... where you just don't see that with buses. (Seymour Smith: 16.13, 16.14)

[Preference was for integration, the qualities of the light rail, quieter, and a sense of certainty and safety and this fits with the increased density and urban activity. LSS 16.13, 16.14]

You could have selected a fully grade separated system that ran down through this environment with the maximum travel time, that would have ticked the box in some sense but would not have created a system that was integrated into the environment, it would not have created something that was part of the fabric, and as a consequence you are not embedding these other sustainable modes into that urban fabric, you are not saying, 'well it can fit, it can work'. As soon as you segregate it, it is a second grade system, it might be faster and in the day also bloody ugly and it doesn't reinforce the fact that we have to support active modes and look at more sustainable travel patterns, by integrating it at ground level, (Seymour Smith: 16.18)

[A fully grade segregated mode might have ticked some boxes but would not have integrated into the urban environment. As soon as you segregate it is a second class system. LSS 16.18]

The focus there,.... there any discussion around the wider LU impacts in the corridor? No, in a formal sense there was no project objective, or process to look at that, at that point. It certainly became an element when I was working for the city build team and we were looking at future stages and trying to understand what LR infrastructure will do to areas and having that as part of a holistic view of what the benefits of LR are, but ITO Stage 1 it really did not get the run that I thought it deserved. (Grennan: 13.5)

[Formal project objective did not consider the wider land use impacts in the corridor PG 13.5]

Section Four - Enabling TOD - Route and Station Location.

The route and station location is obvious

I think a lot of it has been lucky coincidence of things that have happened over the years... we have had a corridor with the beach on one side, so there is a natural barrier to movement and a river on the other, and flood plains, there has been a fairly small corridor for development ... there has been a welcoming attitude to development in the city, many parts of Surfers Paradise have been developed many times over and increasing density each time. So I think the land use side of the planning has been, that where the development has been, that is where the density has been. (Grose: 1.7).

[Gold Coast has an urban form that provides a natural barrier to movement and a fairly small corridor for development. It also has a welcoming attitude to development and that is where the density has been. RG 1.7]

In a way parts of the corridor was a no brainer. (Brooke: 2.11)

[The corridor was obvious. SB 2.11]

... it was difficult to shy away from because it was already staring you in the face, it was already there, it was really a matter of most appropriately, most efficiently connecting up those dots. (Brooke: 2.15)

[The solution was obvious, it was already there. It was really a matter of connecting up those dots. SB 2.15]

When we are identifying where the route should go, it was more about it is already there so how can we get stations closer to the centre the action of where all that action was happening rather than generating more. (Bitzios 2.12)

[The route was already there so it was about getting the stations closer to the centre of action, not generating more. DB 2.12]

It's pretty damn obvious that it, that one, isn't it, that it should go somewhere down the coast, but there are plenty of occasions when you would have different options (Deutscher: 3.23)

[It is pretty obvious that it should go somewhere down the coast. KD 3.23]

We stuck to the courage that others had shown before, that we were going through to where people need to be. We are going to take a transport system through a city, because

that is where the activity is. We did not do it around land at the time, we did it around people and where the activities are so that is why, when I reflect on that dialogue... led by the need from the Federal government, led by the business community... it was an alignment of right time, right place. (Carroll: 8.1)

[We were going to where people need to be, where the activity is. We did not do it around the land at the time. AC 8.1]

Future stages and land use change

It's a transformational thing for the city ... No other city has tried to build a whole system in one go, they all start with one bit and gradually expand and extend, that's been the history of anywhere it has happened. (Grose: 1:40)

[It's a transformational thing for the city. Transit systems are built in stages. RG 1.10]

If we were wanting to have a conversation about future land use we should not be even thinking about going to Helensvale, we should be trying to get down to Palm Beach, Coolangatta, Bilinga because that is where the regeneration is best to show that this is about changing the shape of the city. (Carroll: 8.15)

[Future stages should be determined by the opportunities for regeneration and urban change. AC 8.15]

Probably the greatest angst towards the end, when the decision was finally made to proceed was... Griffith University to Helensvale, whether the route should go past Harbourside... the current jump of point is in the right spot. I think it would have diminished project ... in the first stage, because of density and lack of mass at that end. (Power: 4:22)

[A lack of density and mass in the corridor would have diminished the project. DP 4.22]

You need to look at... Stage 1 as part of a much longer term, longer distance strategy... The danger there is that if it is not a success from day 1 you have a system sitting there. (Brooke: 2.11)

[Need to look at Stage 1 as part of a much longer term strategy. SB 2.11]

And then there is the potential to extend to where there may be new development, examples with the Sydney Light Rail where they have built along corridors where they ... didn't happen as quickly as they expected so it struggled in itself. (Brooke: 2.13)

[Without the extensions being tied to new development, the systems may struggle. SB 2.13]

Where the social equity comes into it is when the light rail connects to the heavy rail... to provide access to all the great things that the Gold Coast has to offer, equitable access to those that live here.” (Molhoek: 14.7)

[Connecting to the heavy rail provides equitable access to all the great things that the city offers. RM 14.7]

My only frustration is that in Stage One we have opted not to connect to heavy rail and I think that is a huge limitation of the viability of it and because it does not have that connection the success of it in the future may be that it did not attract the patronage. I think there will be a reluctance to get the heavy rail to Nerang and get the bus to Griffith and to go somewhere else and so think the priority is to get it hooked up to the heavy rail as soon as we can. (Molhoek: 14.12)

[Frustration that it did not connect to the heavy rail as this may affect the patronage as people are reluctant to transfer. RM 14.12]

I do believe that once the project gets up and running there will be quick acceptance by the city but if it is really going to be effective you have got to take it the full length of the city. We have also got to do the east west links to work effectively. (Baildon: 5.16)

[Need to run the full length of the city with the east and west links to be effective. GB 5.16]

I think that this will change the city. The first determinant was sugar, the second one was the Jubilee Bridge, the third was Kinkabool and the fourth is the light rail... Universities change the city. In my view at the beginning you have a lot of tourists and students and I think the public will eventually get adjusted. What is also important is to support the light rail east/west connections. (Kozlowski: 10.20)

[The light rail will change the city. In the beginning you have tourists and students. The public will eventually adjust. It is also important to have the east/west links. MK 10.20]

I would think that the light rail will connect to the heavy rail somewhere, not sure if it is Helensvale. It would have gone to Burleigh and you would have pedestrian precincts in both Surfers and Southport. (Poole: 15.22)

[The light rail will connect to the heavy rail, somewhere. It will go to Burleigh. TP 15.22]

it was selected for the right centre, the right site, the right sort of density and I think the success of this project will allow it to expand, to start creeping out through the network and people will start getting used to the concept, that it is not just car and road space, that you are sharing the road space, ... I see success, and success on the Gold Coast and will see it roll out and even in Brisbane potentially, I think they will have another crack in Brisbane and I

know the Sunshine Coast, even though they don't have the density, but in the next 20 years they may have the density... as well, (Seymour Smith: 16.21)

[The land use fundamentals are right so that it can expand on the Gold Coast. People will get used to it. It will be successful and it will influence other places to do light rail. LSS 16.21]

The station locations were predominantly driven by where is the closest signalised intersection; it was very much about accessibility and spacing. (Seymour Smith: 16.3)

[The station locations are driven by the accessibility of signalised intersections. LSS 16.3]

The route and station location is not obvious

The one that I am particularly familiar with is the one in Southport, you had a couple of options for getting into the CBD but the one where there was the most debate was the Scarborough St option versus the Marine Parade option. One was about going through the main street where you have all the activity in the CBD and the development potential versus going on the edge, along Marine Parade which was much more convenient from a footprint perspective but it was also travelling outside that retail precinct. They had their own merit, one was cheaper to build, ... the design at that point was something that made it more painful for the community, ... much more in the heart of the CBD... Was that an easy decision? no, no, it was quite heated and to some extent the station locations drove this alignment because of the perceived development potential at both ends of that street. Ultimately a station at the bottom end of that street rather than on the edge, that probably made the biggest difference in the decision making. (Chang: 11.16, 11.17)

[Southport RASL had two contested options; one was convenient, cheaper on the edge the other connecting to the activity and development potential in the heart of the CBD. The decision was heated. The station locations drove the alignment. MC 11.16, 11.17]

so who is and what is driving the mode decision and the corridor decision? so what I was seeing, the property impacts and the actual alignment was that there was no thought as to the micro level, the CB outcomes so if it made sense as an engineering solution ITO the radius of the track or the ease of the public utility plan or elevations to do it in a certain way then that was the only reason that it looked the way that it did and after the event property did manage to get some of those design decisions changed mainly because we were able to say that "if you do this, yes it might cost a little more ITO the constructions costs but here are the benefits ITO of the land costs", we were never able to get an outcome around CB, that was never enough to change the design. (Grennan: 13.7)

[The project was not focussed on the micro level/city building outcomes, land value opportunities did impact on design decisions. PG 13.7]

There were a few who wanted stations right near them, they understood the effect it would have on their product. Interestingly enough there were some that did not. In Southport, I recall the station in Scarborough Street, some people wanted it pushed all the way to the southern end of Scarborough Street and nothing in the middle, but that was the minority. (Power: 4.16)

[Some people [developers] understood the effect that the light rail would have on their product and wanted stations right near them but in Southport some people, a minority, did not. DP 4.16]

I had this debate when we did the Southport Central Master Plan. We had a lot of debate with stakeholders and businesses, the issues they think we should address in the Master Plan. I would say a lot of them, a large percentage of them preferred the option of either LRT somewhere out of mind, out of site, underground or wherever, or to go along Smith Street and Nind Street and Marine Parade. (Kozlowski: 10.12)

[There was a lot of debate in Southport. A large percentage of them preferred the LRT out of sight, out of mind, underground or wherever, along Smith Street or along Marine Parade. MK 10.12]

I have thought about this a lot, there was significant pressure to put a station at Australia Fair, and it makes sense to me and I cannot understand why. I know that the idea is to put them at 800 metre lengths, but that is not necessarily convenient ... my view is that there could have been a better job done with that. (Baildon: 5.12)

[There was significant pressure to put the station at Australia Fair. That made sense and could not understand why that did not happen. GB 5.12]

Some existing constraints have been in play. A good example has been not getting the station outside Australia Fair. There were other things that constrained that. Whether or not that would compromise the solution remains to be seen, but perhaps it will do. That would have been the best place to have a station, right in the centre of Southport but traffic movements and bus movements prevented that from happening... (Poole 15.13)

[Existing constraints such as traffic movements have constrained some station location decisions such as a station outside Australia Fair. TP 15.13]

The route and station impact on centres

Long versus short term

It was a similar issue, going through an established area, it was magnified because it was far more mature and a lot more congestion, kerb side usage issues than there are on the Gold Coast. And the closer you come to the centre – the more impacts? Well real and perceived

and I think perceived is the most important one, particularly the traders; they did not care about the light rail. This is in Brisbane, the same could be said for the consultation through Southport, they were more interested in the one or two car spaces out the front of their business, that was the sort of mentality we were dealing with, a lack of perception about what it will feel like, or look like or the services and how it will affect their business. (Bitzios: 2.16, 2.17)

[Brisbane light rail had similar issues with running in a mature area. The trader perception is negative, especially in relation to parking. DB 2.16, 2.17]

There was a lot of that on the Gold Coast early on. If you remember the Southport Chamber of Commerce was very vocal against it and there were a number of fiery meetings there. The rest of the areas, Surfers Paradise was probably swayed either way... The retailers were more focused on making a living today ... not five years into the future. Those impacts, the loss of parking is the most single important thing. (Brookes: 2.18)

[Southport was strongly against it. The retailers were focused on making a living today and on the parking, not five years into the future. SB 2.18]

Well the retailers are generally small business people, ... their sole focus is within the four walls of that shop and the customers that can walk past the door, so they will complain about the fact that there is no parking or too many cars ... there is no way around that. There are people that will go broke during the construction process; it is just the attrition of the war. Whereas the developers understand the function will change, and the densities and the opportunities will change, so they are actually seeing it for what it will be rather than what it is. (Power: 4.13)

[Retailers focused on the shop and the customers and there are people who will go broke during the construction period. The developers have a longer term view of the land use, they see what it will be rather than what it is now. DP 4.13]

So in your role you deal quite closely with those property owners and traders, so how intense is that concern? Extremely intense, it is a thing that we have to deal with daily, it cannot be resolved by us saying that LR is going to be good in the future, we really have to be understanding of their concerns, and acknowledge the pain that we will go through but these people are not looking two years into the future, we are in a very difficult financial time, we have 25% vacancies in commercial properties in Southport and they are really looking for someone to apportion blame to and we are it. *And on the other side of the coin are the developers, do they have a different view of this?* 13.13 Yes, developers are extremely excited about the project and some are positioning themselves by acquiring land around stations, they can see a potential windfall in property values once the project is completed, other developers who are at the stage of design are about to submit DA's are very keen to talk to the project about the way that they can use the locational attributes

and maximise their sales, certainly a big part of what we are doing ATM is interface (Grennan: 13.12, 13.12)

[RASL has impacts on local traders who have short term concerns where developers can take a longer term view of the project. PG 13.12]

Look at the British cities, I mean Edinburgh is bringing the tram back into the central city... Because it is one of the elements of the urban environment and it fits very well. (Kozlowski 10.8)

[Edinburgh is bringing the tram back into the central city because it is one of the elements of the urban environment and it fits very well. MK 10.8]

Some of them [Southport] thought that transport is better at the back of the city, rather than the centre of the city, and this goes back to the previous question. If it was a BRT maybe there could be an argument behind that but with a light rail it should go in the central part of the city. (Kozlowski: 10.13)

[Southport wanted transit out of the centre. If it was BRT there is an argument for that but with light rail it should go in the centre of the city. MK 10.13]

"A lot of it was about where was development going to happen in the future, and where would stations be in the future, i.e. Scarborough Street in Southport was a prime one. The planning scheme envisaged that there would be lots of development, it is not there now. It was mooted as a future station, and will go in up front because there are lots of reasons there. (Grose: 1.33)

[Stations would be located in sites where, according to the planning scheme, development was going to happen in the future. RG 1.33]

I think it is different things, you are travelling through the Main Street, that is where it is travelling, it really showcases that retail frontage, maximises the retail exposure. People started to understand how the catchment works for the stations, the potential catchment of each station and for Southport South the catchment south of Scarborough Street, and there was the potential ... the land take for the project would open for major development. (Chang: 11.19)

[The Main Street is where the retail activity is and the light rail showcases that. People also started to understand how the station catchment works and the potential for the longer term development of the land. MC 11.19]

Route and station locations driven by development opportunities

Some would use to their advantage so they can get the best yield out of the development, car parking etc. but others truly believed that their site would benefit from that and what they are trying to develop. Q1 was a good example, quite proactive. (Brooke: 2.20)

[There was a belief that the light rail would benefit their development sites, Q1 was quite proactive around that. SB 2.20]

In all the briefings I received ... and other projects that were similar, we knew there would be significant growth and development within, at least four hundred metres of the tram line itself, and I was very enthusiastic about that as the project was coming through mostly older developed areas and Southport etc. So there was great opportunity for high densities to be created and the figures have shown that business does increase when the line gets established. (Baildon: 5.11)

[We knew that there would be development in the walk up area to the light rail. There was great opportunity for high densities and new business and enthusiasm about the impact on mostly older developed areas such as Southport. SB 5.11]

There was a strong argument to say that Broadbeach, Surfers Paradise and Southport had sufficient density and mix to really benefit from that sort of infrastructure, so it was almost saying the alignment of density with amenity, which was the beach, would then be complemented with the light rail infrastructure and service and that would help us meet the objectives set out in our regional planning framework which was to have transport integrated with land use. (Papageorgiou: 6.18)

[Regional planning framework objective of integrated transport and land use was met by the light rail running in Broadbeach, Surfers Paradise and Southport with the alignment of the density, with amenity which was the beach. MP 6.18]

So you don't think that we are up to speed on the financing arrangements for FS's. 13.16

No, I think when you look at the design of the corridor, the track technology, the vehicles, it is of a world standard, cutting edge, but the way that we fund LR infrastructure is way behind. *So what is missing in that equation then?* 13.17 We only look at patronage to support LR and there are other ways to generate the funding needed to get LR out of the starting blocks, the lack of acknowledgement that LR leads to an increase in land values leads to lack of utilisation of LVC as a funding mechanism for FS. Unless something changes, Stage Two will happen and there will be certain property developers and owners who will get a wind fall out of the government investment, I am all for people making money out of infrastructure but the government needs to get its fair share, there are so many things that we can do but we are not there. (Grennan: 13.16, 13.17)

[Funding model of system does not take advantage of land value increases. PG 13.16, 13.17]

I notice in the IRTTP we start to connect the dots between transport and land use, how advanced was that thinking in Council? We understood that it would result in increased density along the route... we always understood that it would result in a change to the form and function. It was probably about seven or eight years ago that we realised the scale and intensity, but also the potential impact on the traditional CBD... I think the land use component has been more of an evolutionary thing rather than something that was recognised immediately. (Power: 4.10)

[It was probably seven to eight years ago that we realised the increased scale and intensity of light rail and the change to form and function. That has been an evolutionary thing rather than something that was recognised immediately. DP 4.10]

Is there a way in which that debate around Scarborough Street changed the way people were thinking about the light rail? Yes, probably, in the first moments of the discussion it was 'oh my god', massive impacts, that is what people will see, that is a massive impact decision. Then we started to think about okay we have available land that can be amalgamated, could be part of the renewal of that precinct and we could all sorts of things with the development industry, get some traction around that as well. It was probably one of the tipping points to put a focus back on the land around the station. (Chang: 11.20)

[There was an initial 'oh my god' moment, massive impacts [in Scarborough Street], followed by realisation of the land development and renewal opportunities. MC 11.20]

Station locations were chosen on the basis of where the traffic lights were because we did not want to have any bigger impact on what was already there, just to get the project as opposed to, to have community support, as opposed to no I am going to break some eggs, very strong political support, very strong community push for something that is going the change the land use, you don't get enough of it up front, if you are retrofitting you are not going to get an optimal solution. (Seymour Smith: 16.23)

[Station locations chosen on the basis of traffic light locations to minimise impacts as opposed to having more support to make bigger decisions that impact on land use. LSS 16.23]

Another significant route decision, one that you led, was the one through the old Indy route... what drives the project to change the route in an extraordinary difficult process? Yes... they were forced to rethink the circuit and that opened up the big opportunity to relook at the route and travel down Surfers Boulevard rather than Ferny Avenue... By that time we were starting to talk about City Building in the project... Ferny Ave is so constrained by the volume of traffic that it carries that its potential was pretty low. There was development

potential in the area, big vacant lots, but the street environment is not appropriate for changing the character of that place, making it more permeable, really transforming the road reserve. This is one of those key alignment decisions that could possible transform that part of Surfers. (Chang: 11.21)

[The opportunity to rethink the alignment focused on the improved street environment and the character of the place and to transform that part of Surfers. MC 11.21]

If we take the route first, the greatest driver for the route is the future plans for the city, we had committed to designing a system to take people where they wanted to go. It was also our understanding, were people likely to go to Southport or Surfers and Broadbeach in thirty years' time, think we satisfied our self that yes they do. The station location was an interesting one. I thought that there would be a lot more debate about the station locations, even during the bid phase for the Operator Franchise, there was very little in the way of alternative proposals, now that indicates to me that we had considered all the factors that determined where stations went, and as you know they generally go in the places where we have the highest concentration of use, and what we also tried to do was try to recognise locations for their potential for future land use. I remember those discussions about whether that station happens now or we keep it for later and I think we agreed it was something that would be a catalyst for the southern end of Southport so we put it in now. I think the land use has generally driven station locations.... Existing and future land use followed. The station location is all about the land use and the other thing was the issue of accessibility and connectivity, we wanted stations that people could get to easily and locations where it would make sense, where people could intuitively find the stations. [Poole: 15.3]

[Land use, concentration of use, accessibility, connectivity and activity now and in the future is driving the station locations. We agreed to put the station at the southern end of Southport now as it would be a catalyst for land use change. TP 15.3]

Changes happen around that infrastructure, so at the moment what is being done is they have selected a corridor, selected a corridor with potential, it has potential for land use change and density change and redevelopment but that has to happen for the system to be successful. Even if we are go back to Treasury and TTA, in order for this project to achieve mode share goals, patronage share, revenue levels etc. etc. that land use change still has to happen. (Seymour Smith: 16.16)

[Corridor has been selected for its land use change potential and that land use change has to be realised for the system to achieve its transport goals. LSS 16.16]

Regarding the Scarborough Street option, rather than do the seaside thing [Marine Parade option], was that also about maximising land use activation? For me it is all about

maximising land use activation because that area of Scarborough Street, whilst busy, is not friendly or attractive, this has the potential to renew that, to revitalise it. So instead of the daggy shops that face onto Scarborough Street, I would hope that we would start to see some alfresco dining out there, lower traffic volumes and really creating a central hub that people will celebrate rather than just drive through or race across the road. (Power: 4.20)

[Maximising land use activation and revitalisation objective drove Southport RASL. DP 4.20]

Similarly when we went to Surfers Paradise we had one route option, they thought there were others and again there was a sense of well why would you build on the Esplanade, it is not a double edge, there is no sense of an active frontage so we talked to them about how you get an active frontage and active catchments and walk ups because that had numbers around it, from some of those in the community they started to understand, well what can I do to make money out of that, through development, or the leaders saying what can I do to make this a great place, how can we influence the land use around it. (Carroll: 8.15)

[The route options in Surfers Paradise were supported by the realisation of activated streets and active, walk up catchments and associated development opportunities. AC 8.15]

The conflict between land use and transport planning in the route and station location decisions

The conflict between land use and transport planning in the RASL decisions

... So where you do get conflict is around “that is too hard, too expensive” which was... the GC rail line put in the bush, because they did not want to go into the middle of town, because it is all too hard, people complain about the noise and stuff. There are plenty of examples of LRT systems that have been put into freight corridors, because they could but in the end they have gone back and redeveloped along that corridor and it has probably turned out ok. That was the transit system shaping the city, nothing wrong with that but all too often it is easy, “we could do that, we could not do that”, we took the course of least resistance so we did not quite get to the town centre, because that last mile was too expensive. So the train station ended up on the edge of the town, plenty of examples were you see that ... That’s a problem with the thinking, that’s not a problem with the land use or the transit. (Deutscher: 3.21)

[Conflict in RASL decision making process about easy, cheap, edge alignment such as the Gold Coast heavy rail line versus going to the centre. It is not a problem with the land use or the transit but with the thinking. KD 3.21]

So then, ... going through the debate around the alignment, the land use really came into play, ... the debate going around the centres, taking the easy way, the engineering way versus the land use transformation potential... *And how vigorous is that debate of one*

option over another, a transport planning option over a land use option? It was pretty heated, yea, I think there were pretty heated debates and the frameworks we had to assess, alignment options, they all came pretty close, so it was something would make it tip one way rather than the other but maybe the framework was not particularly adapted to what we wanted to achieve, maybe skewed one way more than the other. The parameters maybe should not have been weighed the way that they were but I think we ended up with the right decision (Chang: 11.5, 11.6)

[The land use came into play in the debate over alignment options, the easy way versus the land use transformation potential. The framework was not adapted to what we wanted to achieve with land use but we ended up with the right decision. MC 11.5, 11.6]

Being totally honest I think I have some concerns for the future of the project ITO the drop off in the CB, I think it was right up there when we had the money from IA, there was a drive to get CB outcomes, and I thought that was an inspired decision to get CB outcomes, e/one seemed to get it but now we have come through all of that and we are in delivery stage we are very much into the transport project framework and it worries me that we have got that mindset going forward and that may flow into the next stage, I think we have lost something there, everyone has gone back into their comfort zones, 'let's do things the way that we have done them for the last 15 or 20 years. Think there has been enough good decisions made up until now and that Stage One will be a good CB project but we have taken one step forward and two steps back in the past twelve months.(Grennan: 13.18)

[concern that as project has moved into delivery phase that city building has dropped off as the transport objective has come to the fore, transport is the comfort zone. PG 13.18]

Section Five – Is GCRT Transport or a Land Use Project?

I think it has been led predominantly by transport objectives. (Baildon: 5.18)

[Project led by transport objectives.]

From my perspective it was essentially a transport planning exercise, because that was my background and through the project I came to terms with the land use as well.... In terms of other people I think it is definitely an eye opener on the land use benefits... In the community, I think there is... a shift in relation to the cities future... I mean that land use discussion is really coming through the light rail planning phase. In the future stages we will see that a lot. (Chang: 11.4, 11.5, 11.13)

[Viewed from professional perspective [engineering] it was a transport planning exercise, but there is a shift to a longer term vision and to emphasise the land use objective and this will influence the planning of future stages. MC 11.4, 11.5, 11.13]

It has gone through phases. When I started there was lots of talk about it being a transport project, we did have a very healthy period where we got serious about the CB aspects, one of the problems that the project has had is that it has moved, in the zone, what we have got is going from a TL project to QT to now TQ and Main Roads, each time we have moved we have had to start again, to talk to our new owners about what is important, I think right now we are almost back to being a transport project, because QT and MR is very much about roads and structure and engineering solutions and it is certainly thought of by that body as a transport project, the very high level rhetoric is about CB but at the level that does the nuts and bolts of the project it is not seen as CB. (Grennan: 13.9)

[Initially a transport project but later focus on land use, concern that it is reverting back to transport. PG 13.9]

It was certainly an integrated transport project... it was never just a light rail line, as a sort of vanity piece for the Gold Coast. it was a suitable form of infrastructure that could then form a network with other infrastructure... and it shared common objectives around managing growth and promoting density and mixed use with the land use planning framework. (Papageorgiou: 6.28)

[Never just a light rail line. It was an integrated transport project, part of a network and tying in with higher level planning objectives. MP 6.28]

Probably what was the focus of our attention was that we knew that the centres Southport, Surfers and Broadbeach would hit gridlock at some stage, and so for probably five years that was driving force for the project rather than changing the land use patterns. (Power: 4.10)

[Southport, Surfers and Broadbeach would gridlock so for probably five years that was driving the project rather than changing the land use patterns. DP 4.10]

Until about three years ago, I think it was led by transport objectives... I am not suggesting that the land use objectives or outcomes were not recognised but the driver was transport... it was not till about three to four years ago that people really start to talk about increased values, renewal, revitalisation, that the business community in particular, started to really grasp the extent of it. (Power: 4.16)

[Initially led by transport objectives but in the last three to four years people/business people, start to talk about and understand the development opportunities. DP 4.16]

Very clearly the project emerged from the transport planning area and it had a strong focus, not on city building, that was part of it, but a strong focus on the mass transit task, on more sustainable ways of moving people... So as the city grows the need to move people into the busy part of the city becomes more of a mass transit task its mathematics, the convenience of the car, a massively convenient vehicle, it becomes a liability when you have to sit in traffic and when you have to park. So mass transit becomes a natural part of that solution

and that was driving the need for sustainable mass transit system, was driving the project as much as land use intensification.... Well subject to my previous comments, the land use already being in place. I think that this is about choice of the route... I think it is fifty/fifty because the business was there, the opportunities to move people, the congestion of the city... (Deutscher: 3.8, 3.37)

[Project clearly emerges from the transport planning area with strong focus on the mass transit task. City building is part of it. The need for a sustainable mass transit solution is driving project as much as land-use intensification. It is a fifty/fifty outcome. KD 3.8]

I think it started off as primarily a transport project. As we started to get to the key decisions it started to become... all of a sudden it started to become more of a planning project and more recently the economics of it all and the ongoing benefits to the economy and to the city image starts to play a more important role. (Case 12.18)

[It was primarily a transport project but it becomes more of a planning project and the wider economic benefits and city image become more important. BC 12.18]

If there was no land use we would not be getting the system anyhow. It is all about bums on seats, the fact that there is a population and a user group there ready to use this thing so that from day one there would be people riding on it and hopefully lots of them rather than building something with the hope that development and passengers might come in the future. (Grose: 1.35)

[The system exists because of existing land use and the day one patronage rather than the hope of future development and passengers. RG 1.35]

To what extent have we moved from a transport project onto something else? Enormously, and that is because we have landed the transit solution... We understand that we can now comfortably put that to rest because we answered that... Because we made really good decisions about that it has opened up other opportunities. (Carroll: 8.16)

[Once the transit solution was properly landed and because the project made good decisions other opportunities have opened up. AC 8.16]

I certainly see it as a land use project, and we have said it before, it comes down to city building, really ensures that city will continue to grow. People have got to move around... we are encouraging increased densities within these corridors but we have still got to get them to their schools and everything else, so it's critical on that side that there is a good balance there. I think the corridor has been partially, probably a lot, selected because of that land use element. (Brooke: 2.46)

[It is a land use project; it comes down to city building. The corridor has probably been selected because of the land use element. SB 2.46]

My personal point of view is that it certainly is a city building project. It certainly will change the way the Gold Coast, our residents think about the Gold Coast. (Bitzios: 2.47)

[It certainly is a city building project. It will change the way that residents think about the Gold Coast. DB 2.47]

Well I hope it is an urban design project, creating places in the city and very good urban design outcomes that is what we always hoped this project would deliver and apart from that it will help people to move from one place to another... *When you were doing the... consultation were people talking about a transport project a land use project, or an urban design project?* Definitely about a transport project.... *Do you think that people have an conception of something beyond that?* ... No, no they don't, they don't see what the benefits are that it brings. (Kozlowski: 10.18, 10.19)

[Hope it is an urban design project, creating better places and moving people. Community still see the project as a transport project and do not see the benefits. MK 10.18, 10.19]

It is a land use outcome... Was it always that? I think if we were all being honest I would say... in the beginning the project was always about more than just the transport, the public transport aspects, always. Was it then the same as what it is now? Probably not... So for those who were involved in the project, we had to sell it as a transport project because that is what people knew and that was appropriate because that's one of the biggest risks to the city. (Rowe: 7.22)

[The project was always about more than transport. It is a land use outcome but was sold as a transport project because that was what people knew. WR 7.22]

And is there much difference about where the State is coming from and where Council is coming from? I think from a transport point of view back then, no. I think probably now, yes. I think Council has got it in terms of this being a city building more than a transport project, I am not sure that the State is in that space yet. But certainly back then transport was quite well aligned, and probably the alignment was that they did not have to deal with perhaps more contentious issues about how far transport issues go in relation to land use integration and in terms of activating the city and things like that. I think maybe that is the next wave of policy documents in terms of transport. (Poole: 15.3)

[Originally the State and Council understood it was a transport project. Council now understands that this is more a city building than a transport project, the State is not in that place yet, maybe in the nest wave of policy documents. TP 15.3]

When we moved through the CDIMP itself it took a long time for the TOD element to start coming on, to start looking at how property uplift and property value capture really only came into the project about two years into the CDIMP... so that has come onto the project and it started evolving probably, almost after the project got the green light from the Feds,

so it was not until then that we started to see some of the TOD principles applied until then in the greater sense. (Seymour Smith: 16.3)

[It took a long time for the TOD/land use elements to come on. It started evolving about two years into the CDIMP, after the project got the green light from the Federal Government. LSS 16.3]

END

Appendix H - Peer Reviewed Papers Published in Relation to This Research

Mepham, David. (2011) "How Does a Transit Project Become a TOD Project?" Smart Growth and Urban Design Conference Perth, September 2011.

Mepham, David. (2011) "From Transit to Transit Oriented Development – Case study of the Gold Coast Rapid Transit Project", 2011 International Urban Design Conference.

Mepham, David. (2010) "Gold Coast Rapid Transit: Planning for Pedestrian Friendly Transit Oriented Development", Walk 21. 2010, The Hague.

<http://www.walk21.com/papers/502B%20David%20Mepham%20Getting%20communities%20back%20on%20their%20feet.pdf>

Mepham, David. (2009) "Transit on the Edge - Mode, Urban Environment and Local Mobility: Understanding and Resolving the Conflict", 2009 International Urban Design Conference – Survival: Implementing Tomorrow's City.

<http://www.urbandesignaustralia.com.au/images/Papers09/David%20Mepham.pdf>

Mepham, David. (2007) "Creating an Accessible Rapid Transit System", 2007 International Urban Design Conference – Waves of Change.

<http://www.urbandesignaustralia.com.au/program.htm>